HC - HATCREEK 78 (3) B

ROTARY CORE PUNCH

DRILL HOLE

DATA

BOOK

140 2/3

Type of drilling: ROTARY CORE POLYMER FLUSH

Coordinates: 77,255 N. 14,324 E.

DRILLHOLE No. 78-857
Sheet 1 of 11

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SLIDE AREA (ALEECE LAKE)

Bit: HW TRICONE & HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min/m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	0	1068.9							
				HW Tricone 0.4	1068.53							.4-1.52 Triconed through till.
1/6 PM				1								
				HQ 1.52	1067.41							1.52-9.45 olive green, firm to stiff, clayey SAND w. some silt and some med. to c. gravel; some soft zones but prob. the result of drilling, gravel is generally granodiorite (TILL).
	1 1 0		79	2								
				3			MC40.2				L.C.	3.09-3.13 Sample #1, M.C. NOTE: Some local clay zones and some silty sand zones within the till.
	1 0 0		25	4							L.C.	
												4.63-4.90 core is very soft.
	1 4 0		21	5								
				6							L.C.	6.40-7.92 soft ground, no recovery, probably sand.
	1 0 0		0	7								
												7.92-9.45 tube didn't lock, lt. green, brecc., tuff. sandy siltstone in bit when rods pulled, poss. still till.
	1 0 0		14	8							L.C.	
				9								9.15-9.45 c. gravel w. some lt. green sand and clay matrix, poss. fell in hole.
	9 0		100	9.45	1059.48							9.45-18.98 sl. weath., brecc., med. green, mod. weak, tuff. SILTY SANDSTONE.
				10								

Contractor: TONTO

Logged by: AH

Date started: 1 JUNE 78

Checked by: RE

Date finished: 5 JUNE 78

Date: 1 JUNE 78

Remarks: Final HW casing depth 40.24 m.
HW casing to 9.15 m.

Golder Associates

Scale: 1:50 metric

Type of drilling ....ROTARY. CORE. POLYMER FLUSH...

Coordinates .....77,255 N.....
.....14,324 E.....

DRILLHOLE No. 78-857
Sheet 2 of 11

Rig .....LONGYEAR 44 WIRELINE.....

Dip .....90°.....

Location ..SLIDE AREA (ALEECE LAKE)....

Bit .....HQ DIAMOND.....

Azimuth .....

Reference elevation ...DRILL FLOOR....

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	10								TUFFACEOUS SILTY SANDSTONE Cont.
	8.0	71	98						2.7			
	9.0	40	100	11					2.7			11.56-11.67 core is v. brecc.
				12		? 3.93						12.50-18.98 dendritic Mno on fract. planes.
2/6 AM	7.0	45	100	13			UCS 2586 (375.4) MC27.7		2.0			13.15-13.35 Sample #2, Uniaxial. 13.35-13.39 Sample #3, M.C.
	6.0	66	100	14					2.0			14.60-14.74) brecc. zones. 15.28-15.48)
	7.0	52	100	15			MC39.8		3.0			15.64-15.75 brecc. zone. 15.97-16.21 Sample #4, Uniaxial. 16.21-16.30 Sample #5, M.C. 15.80-18.98 core v. weak w. mod. str. frags.
	7.0	90	100	16					1.3			
				17								18.70-18.74 bentonitic clay band.
	7.0	86	100	18.98 19	1049.95				3.3			18.98-26.21 mod. weath. green and olive brown, v. weak to mod. weak, rubbly texture, fine grain bentonitic CLAYEY SILTSTONE BRECCIA w. zones of clayey gouge and some sandstone seams.
				20								

Contractor: .....TONTO.....

Date started: .....1 JUNE 78.....

Date finished: .....6 JUNE 78.....

Logged by: ..AH/IT..

Checked by: ...RE...

Date: ..2 JUNE 78...

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 77,255 N, 14,324 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:
Location: SLIDE AREA (ALEECE LAKE)
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-857

Sheet 3 of 11

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	20								CLAYEY SILTSTONE BRECCIA Cont.
	6.0	88	100	21			MC 35.9 LL 104.0 PL 52.8 MC40.6 LL119.6 PL55.5		0			21.15-22.27 rubbly brecc. clayey zone, slick surface, iron staining, tuff.(bentonitic?) 21.15-21.25 Sample #6, Limits & M.C. 21.64-21.70 Sample #7, Limits & M.C. 22.12-22.40 Sample #8, Uniaxial.
	7.0	96	100	22					0			22.48-24.10 mod. weath., dk.green and grey, v. weak structureless, highly sheared siltstone. Frags. in clayey matrix.
	7.0	42	60	23					0			
				24							L.C.	24.10-25.20 olive brown plastic clay w. black basaltic sand frags. and basalt cobbles. Gouge material. (mud return erratic).
	6.0	0	32	25								25.20-26.21 lost core.
				26			UCS 1123 (163) MC28.3		0		L.C.	26.55-26.78 Sample #9, Uniaxial. 26.78-26.80 Sample #10, M.C.
				26.21	1042.72							26.21-31.35 highly weath, speckled grey and white, bedded, weak, med. GRANITIC SANDSTONE. 26.21-26.40) highly disturbed, 26.85-27.35) sheared, brecc., 27.73-28.25) clayey gouge, slicken slide surfaces.
	7.0	62	75	27					.7		L.C.	
	7.0	76	100	28					2.0			28.70-29.30 pale cream, poorly cemented sandstone.
				29								29.50-31.35 carb. clay infilling fract.
				30								

Contractor: TONTO
Logged by: IT
Date started: 1 JUNE 78
Checked by: RE
Date finished: 5 JUNE 78
Date: 2 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ...ROTARY. CORE. POLYMER FLUSH....

Coordinates .....77,255 N.....
.....14,324 E.....

Rig .....LONGYEAR 44 WIRELINE.....

Dip .....90°.....

Location ...SLIDE AREA (ALEECE LAKE)...

Bit .....HQ DIAMOND.....

Azimuth .....

Reference elevation ..DRILL FLOOR....

DRILLHOLE No. 78-857

Sheet 4 of 11

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	30								GRANITIC SANDSTONE cont.
	1.0	84	94						2.6			
				31								
				31.35	1037.58				1.3			31.35-52.59 sl. to mod. weath., v. weak, interbedded seams of grey-green and white GRANITIC SANDSTONE, lt. green brown, mass. to brecc. SILTY SANDSTONE and med. brown to brownish-green sheared and brecc. SANDY SILTSTONE, some claystone, siltstone, carb. siltstone seams and tr. of carb. material.
	8.0	100	100	32								
	7.0	60	64	33			MC27.9				L.C.	31.35-32.55 finely bedded, dk. brown, weath., weak carb. siltstone. 31.71-31.78 Sample #11, M.C. 32.55-33.83 weath., grey-green and white, poorly bedded med. granitic sandstone.
2/6 PM						? Making Water						
	8.0	52	100	34			MC8.6	82	2.6			33.83-34.00 lt. green-brown, bedded, weak, silty sandstone. 34.00-34.06 sl. weath., mass., to brecc., dk. grey-green, weak, silty sandstone. 34.13-34.20 Sample #12, M.C. 34.68-35.32 mod. weath., some shearing, lt. grey, v. weak, sand stone (granodiorite composition); some brecc. 35.32-36.41 med. brown to brownish-green, sheared along planes, brecc. mod. weath., v. weak, silty sandstone and sandy siltstone; some granodiorite content.
				35								
	3.0	100	100	36			MC12.1	86	2.0			36.21-36.39 Sample #13, Uniaxial. 36.39-36.41 Sample #14, M.C. 36.41-39.95 sl. weath., mod. dk. green, mass. to brecc., mod. weak to mod. str., silty sandstone w. tr. carb. material. 36.60-36.63 grantic sandstone. 36.88-37.77 silty sandstone is generally brecc. w. some shearing tr. carb. material. 37.77-37.83 greyish-green granodioritic sandstone.
				37								
	10.0	48	98	38				77	3.3			
							MC8.8					38.45-38.47 lt. brown tuff. siltstone. 38.40-38.62 Sample #15, Triaxial. 38.62-38.65 Sample #16, M.C.
				39				87				
	3.0	64	100						2.7			
				40								

Contractor: .....TONTO.....

Date started: .....1 JUNE 78.....

Date finished: .....5 JUNE 78.....

Logged by: ...AH/JT..

Checked by: ...RE....

Date: ..2 JUNE 78...

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY, CORE, POLYMER, FLUSH

Coordinates 77,255 N, 14,324 E

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location SLIDE AREA (ALEECE LAKE)

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

DRILLHOLE No. 78-857

Sheet 5 of 11

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	40								GRANITIC SST., SILTY SST. & SANDY SLST. Cont.
	8.0	63	76	41			LL34.4 PL24.6 UCS 438 (63.6) MC12.9	77 76	1.3		L.C.	39.95-41.52 sl. weath., sheared and brecc., dk. brown, weak clayey siltstone. 40.35-40.36) sandstone of grani- 40.50-40.59) tic composition. 40.94-41.00) 40.66-40.72 Sample #17, Att. L. 40.72-40.91 Sample #18, Uniaxial. 40.91-40.93 Sample #19, M.C. 41.52-41.60) lt. bluish-green, 41.71-41.89) sandy siltstone.
	8.0	100	100	42				58	0			41.89-43.28 mass., w. occ. bedding, lt. bluish-grey, mod. weak, friable, sandstone of granitic composition. 42.31-42.51 Sample #20, Triaxial.
	11.0	38	66	43					.7			43.62-43.69 mass., mod. weak sandstone of granitic composition.
	6.0	20	52	44							L.C.	44.50-44.57 rubbly sandstone of granitic composition. 44.57-44.87 siltstone is mod. str. but fract.
				45					.7			45.06-45.08 granodiorite gravel in siltstone. 45.18-45.26 Sample #21, Att. L. 45.26-45.29 Sample #22, M.C.
				46			LL 44.5 PL 23.3 MC 13.7				L.C.	
	13.0	96	96	47			MC20.2	74	1.3			46.05-46.06 clay gouge along a plane @ ≈ 75° to C.A. 46.06-46.13 brecc. siltstone w. a gouge matrix. 46.13-46.53 siltstone v. sheared and brecc. 46.22-46.42 Sample #23, Triaxial. 46.42-46.44 Sample #24, M.C. 46.99-47.08 lt. grey green siltstone w. some feldspar sand grains 47.22-47.44 med. grey-blue siltstone.
	13.0	52	94	48			UCS 363.8 (52.8)	78	1.3			47.55-47.94 v. weak, sheared, lt. brown siltstone w. some granodiorite sands in one horizon. 47.94-48.60 sl. weath., lam., med. brownish-green, mod. str., sandy siltstone and fine sandstone. 48.75-48.94 Sample #25, Uniaxial. 48.94-49.09 some pale green and pale brown claystone within the siltstone. 49.10-49.14 highly sheared siltstone gouge along a joint.
	14.0	46	80	49				78	2.0			49.39-51.75 sl. to highly weath., mass., med. grey to bluish-grey, v. weak to str., fine granitic sandstone and some shearing.
				50								

Contractor: TONTO

Logged by: AH

Date started: 1 JUNE 78

Checked by: RE

Date finished: 5 JUNE 78

Date: 2 JUNE 78

Remarks: HW Casing to 40.24m

Golder Associates

Scale: 1:50 metric

Type of drilling ...ROTARY CORE POLYMER FLUSH...

Coordinates .....77,255 N.....
.....14,324 E.....

Rig ..... LONGYEAR 44 WIRELINE .....

Dip ..... 90° .....

Location ...SLIDE AREA (ALEECE LAKE)...

Bit .....HQ DIAMOND.....

Azimuth .....

Reference elevation ..DRILL FLOOR.....

DRILLHOLE No. 78-857

Sheet 6 of 11

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	50								GRANITIC SST., SILTY SST. & SANDY SST. Cont.
											L.C.	50.60-50.64 v. sheared, lt. med. brown, claystone.
	2 3 0	38	98	51				77	2.0			51.43-51.63 v. silty sandstone. 51.63-51.75 some shearing. 51.75-52.59 dk. green, sl. weath sandy siltstone w. some shear and brecc.
				52								52.20-52.59 med. green, brecc., sheared, mod. str., clayey siltstone. 52.32-52.37 Sample #26, M.C.
				52.59	1016.34		MC 18.6					52.59-59.40 sl. weath., mass., x-bedded med. to dk. grey-green, str. to v. str., fine to med. SANDSTONE some clay filled fractures.
	2 3 0	72	98	53				70	2.0			53.23- bedding tr. offset 1 cm. by small fault.
	2 1 0	92	100	54				80	2.0			53.99-54.15 sandstone is more weakly cemented and one small horizon is friable.
				55		2	UCS	78				
3/6 AM	10 0	96	100	56		2.07	5919 (859) MC 6.7		.6			55.80-56.00 Sample #27, Uniaxial 56.00-56.05 Sample #28, M.C. 56.79-57.80 highly sheared carb. claystone and thin seams coal.
	9 0	94	100	57			MC 19.2 LL 45.6 PL 25.7		1.3			57.10-57.17 Sample #29, M.C. Limits.
	1 1 0	88	98	59					1.3			
				59.40	1009.53							59.40-77.68 weath., highly disturbed unit of variable green and olive brown firm to weak, extensively brecc. SANDSTONE, CLAYEY SILTSTONE and CARBONACEOUS CLAYSTONE; sheared and plastic lam. throughout.
				60								

Contractor: TONTO

Logged by: AH/IT

Date started: 1 JUNE 78

Checked by: RE

Date finished: 5 JUNE 78

Date: 3 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 77,255 N, 14,324 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: MEDICINE CREEK
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-857

Sheet 7 of 11

Depth m	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
60	10 20	0 50	0 50								SANDSTONE, CLAYEY SILTSTONE & CLAYSTONE
	10.0	92	100					0.6			Cont. 60.37-60.53 thin seams detrital coal. 60.98-61.43 med. green, brecc. and sheared weak, clayey siltstone.
61						MC13.5					61.55-61.92 Sample #30, Triaxial. 61.92-61.96 Sample #31, M.C.
	12.0	84	96					1.3			62.03-62.35 med. green, brecc. and sheared, v. stiff, clayey siltstone. 62.44-63.04 sandstone w. sheared clay surfaces on bedding planes.
62											
	14.0	86	98					2.7			63.37-63.90 med. green brecc. and sheared stiff clayey siltstone. 63.90-64.09 highly carb. sheared v. weak sandstone.
63											
											64.42-65.30 olive green, stiff sheared clayey and carb. siltstone. 64.82-64.87 Sample #32, M.C. 65.51-65.67 Sample #33, Uniaxial.
64											
	16.0	95	100			MC 18.3 UCS 664 (96.3)		0			
65											
											66.07-67.80 olive-green and brown stiff sheared clay and carb. clayey siltstone.
66											
	12.0	96	100					3.3			
67											
											68.59-68.63 Sample #34, M.C. 68.63-68.85 Sample #35, Uniaxial. 68.92-69.28 sheared, plastic, clayey siltstone.
68	10.0	90	98			MC15.5		2.0			
69											
	12.0	94	100					2.0			
70											

Contractor: TONTO
Logged by: IT
Date started: 1 JUNE 78
Checked by: RE
Date finished: 5 JUNE 78
Date: 3 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH

Coordinates: 77,255 N, 14,324 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SLIDE AREA

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-857

Sheet 8 of 11

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				70								SANDSTONE, CLAYEY SILTSTONE & CARB. SILTSTONE Cont.
												70.15-71.22 sheared and slickensided carb. claystone and blocks of siltstone.
	11.0	92	100	71					1.3			71.22-71.93 brecc. section of dk. green str. siltstone. Sheared plastic clay infillings. 71.06-71.10 Sample #36, M.C. 71.10-71.24 Sample #37, Uniaxial.
							MC34.7 UCS 365 (53.0)					
	7.0	100	100	72					0			
				73								73.40-73.81 green, str. section of siltstone. Fracts. logged in core confined to remnant breccia blocks.
	2.0	92	100	74					1.3			
												74.98-75.10 hard sandstone gravels
3/6 PM				75		? G.S.						75.10-75.26 v. brecc. siltstone 75.26-75.82 brecc. sandstone w. only slight shearing. 75.82-76.60 fault breccia, silty sandstone blocks in a sandy gouge
	15.0	0	60	76					.7		L.C.	
												76.60-76.90 med. grey, v. sheared v. stiff, carb. clayey siltstone. 76.90-77.68 sheared and brecc. coal and carb. siltstone w. a flow basalt block included; poss. slightly baked.
	16.0	52	100	77					2.7			
				77.68	991.25							77.68-84.27 fresh joint, fractured, med greyish-green, very str. to extremely str., fine grain, amygdaloidal BASALT w lt. grey clay along many fracts.
				78								78.02- lt. grey, clay and calcite crystals along fracts. 78.02-78.10 rubbly basalt.
	15.0	25	82	79			MC 8.2		4.0			79.27-79.28 Sample #38, M.C.
											L.C.	
				80								

Contractor: TONTO

Date started: 1 JUNE 78

Date finished: 5 JUNE 78

Logged by: JT/AH

Checked by: RE

Date: 3 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER/POLYMER & MUD FLUSH

Coordinates: 77,255 N, 14,324 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SLIDE AREA

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-857

Sheet 9 of 11

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	80								AMYGDALOIDAL BASALT CONT.
	13.0	20	100	81					4.0			
	20.0	24	100	82					3.3			81.42-81.81 basalt is v. brecc. Hole getting tight, cuttings not coming up properly. 82.11- Small fault breccia @ 32° to C.A.
	22.0	28	100	83					2.0			83.0- basalt is becoming finer grained (aphanitic). 83.92-84.27 v. brecc. basalt w. lt. grey clay along fract.
	21.0	35	100	84					0			
				84.27	984.66							84.27-88.90 sl. weath., brownish-green to greyish-green, v. weak to mod. weak bedded CLAYEY SILTSTONE grading downhole to SILTY SANDSTONE and CONGLOMERATIC SANDSTONE w. some carb. siltstone seams and brecc. in the finer grain material.
	20.0	38	57	85					0			
											L.C.	84.27-84.48 blackish-brown, v. weak, brecc. carb. siltstone. Siltstone v. hard, poss. baked.
	19.0	56	88	86			LL71.5 PL30.7 MC28 UCS 416 (60.4)		2.7			84.48-87.58 brownish-green to greyish-green, brecc., weak to mod. weak, clayey siltstone, some carb. material. 84.63-84.74 Sample #39, Att. L. 84.74-84.78 Sample #40, M.C. 84.78-84.94 Sample #41, Uniaxial. 85.10-85.17 brecc. carb. siltstone w. some shearing. 85.65-86.10 some shearing. 86.59-86.72 sl. carb. siltstone 86.72-96.96 Sample #42, Triaxial. 86.96-87.01 Sample #43, M.C.
				87		3.03	MC21.4	70			L.C.	No mud return.
4/6 AM 4/6 PM	19.0	18	100	88		? Making Water ?			2.7			87.17-87.33 brecc. siltstone w. a soft clay matrix, poss. cave. 87.33-87.58 brecc., sl. carb., sandy siltstone. 87.58-88.00 lt. brown, bedded fine to med., mod. weak sandstone and congl. sandstone. 87.73-87.82 dk. brown brecc. siltstone. 88.00-88.90 mod. str. to str. interb siltstone and fine sandstone, some brecc.
				88.90	980.03			65				
	20.0	86	100	89					.7			88.90-102.71 sl. weath., brecc. w. some shearing, med. greyish-green, weak w. some mod. str. areas, SILTY SANDSTONE w. some sandy, clayey siltstone seams.
				90								

Contractor: TONTO

Logged by: AH/JT

Date started: 1 JUNE 78

Checked by: RE

Date finished: 5 JUNE 78

Date: 4 JUNE 78

Remarks: Changed to a combined polymer and QUIK-GEL FLUSH at 87.17 m.

Golder Associates

Scale: 1:50 metric

Type of drilling ... ROTARY CORE POLYMER MUD FLUSH

Coordinates ..... 77,255 N .....
..... 14,324 E .....

Rig ..... LONGYEAR 44 WIRELINE .....

Dip ..... 90° .....

Location .... SLIDE AREA .....

Bit ..... HQ DIAMOND .....

Azimuth .....

Reference elevation .. DRILL FLOOR .....

DRILLHOLE No. 78-857
Sheet 10 of 11

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				90								SILTY SANDSTONE CONT.
	8.0	90	100	91			MC45.2 UCS 393 (57) LL144.1 PL 53.6		.7			89.80-89.83 Sample #44, M.C. 89.83-90.03 Sample #45, Triaxial. 90.03-90.20 Sample #46, Uniaxial. 90.20-90.26 Sample #47, Att. L. 90.60- predominately intact, silty sandstone below this; occ. brecc. zones or shear zones.
	7.0	76	100	92			MC38.1	58	1.3			91.75-92.10 some shearing. 91.85-92.05 Sample #48, Uniaxial. 92.05-92.08 Sample #49, M.C.
	8.0	74	100	93 94				45	.7			93.25- slickensided joint. 93.27-93.50 med. sandstone. 93.50-94.50 mod. weak, clayey siltstone w. tr. sand. 94.58-95.03 broken sandy siltstone and sl. sheared sandy siltstone.
	3.0	100	100	95 96			UCS 3900 (566) MC31.3	50 53	0			95.03-95.56 silty fine sandstone w. some shearing. 95.56-96.20 intact, silty, fine to med. sandstone. 96.20-96.32 mass., sandy clayey siltstone. 96.32-96.79 thickly bedded, mod. weak, silty fine sandstone and siltstone. 96.32-96.61 Sample #50, Uniaxial. 96.61-96.67 Sample #51, M.C. 96.79-97.09 thickly bedded, silty claystone.
	6.0	94	100	97			MC26.7 LL129.4 PL 52.2	44	.7			97.09-97.73 mass., sandy siltstone. 97.20-97.22 Sample #52, M.C. 97.22-97.44 Sample #53, Triaxial. 97.44-97.53 Sample #54, Att. L. 97.73-97.84 mass., med. to c. silty sandstone. 97.84-99.28 sandy, clayey siltstone w. some brecc. and shearing 99.28-99.70 med. grey to med. brown silty sandstone w. some shearing. 99.70-100.12 carb. siltstone and detrital coal in sheared bedding planes.
	4.0	97	100	98 99					0			
5/6 AM				100		? G.S.		27				

Contractor: ..... TONTO .....

Date started: ..... 1 JUNE 78 .....

Date finished: ..... 5 JUNE 78 .....

Logged by: .. AH/IT ...

Checked by: .. RE ....

Date: 5 JUNE 78 ....

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER MUD FLUSH

Coordinates: 77,255 N, 14,324 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SLIDE AREA (ALEECE LAKE)

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-857

Sheet 11 of 11

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	100								SILTY SANDSTONE Cont.
	3 0	100	100				MC 29.2		0			100.12-101.19 core highly sheared, brecc., slick clay fractures. 100.30-100.34 Sample #55, M.C.
				101								101.41-101.57 sheared and rubbly. 101.75-101.80 coal and carb. clay.
	2 0	100	100						1.3			
				102								102.08-102.19 med. grain sandstone.
		0	0		966.22						L.C.	
5/6 PM				102.71								102.71 END OF HOLE.
				103								
				104								
				105								
				106								
				107								
				108								
				109								
				110								

Contractor: TONTO

Logged by: IT

Date started: 1 JUNE 78

Checked by: RE

Date finished: 5 JUNE 78

Date: 5 JUNE 78

Remarks: *The casing lost down the hole. Hole abandoned.*

Golder Associates

Scale: 1:50 metric

Type of drilling ..... ROTARY CORE POLYMER FLUSH.

Coordinates ..... 76,412 N ..... 12,203 E .....

Rig ..... LONGYEAR 44 WIRELINE .....

Dip ..... 90° .....

Location ... SLIDE AREA (ALEECE LAKE) ..

Bit ..... HQ DIAMOND & HW TRICONE ...

Azimuth .....

Reference elevation ... DRILL FLOOR ....

DRILLHOLE No. 78-861

Sheet 1 of 25.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	0	1121.82							
				HW TRICONE								
				0.50	1121.32							.5-1.52 Triconed through sandy gravel.
7/6 PM				1								
				HQ 1.52	1120.30							
	15.0		61	2							L.C.	1.52-9.60 highly weathered, brown, reddish-brown and black, soft to stiff SLIDE DEBRIS w. silty sand, gravel and bentonitic clay; gravel and cobbles are mainly of volc. origin. 1.52-2.20 soft to firm, brown and reddish-brown silty sand and gravel. 2.74-3.05 pale brown, soft highly plastic bentonitic clay and soft sheared black fine grained material (volcanic?)
	15.0		46	3								
	16.1		0	4							L.C.	
				5								
	44.5	32	76	6								6.15-6.80 black sheared, silty and crumbly carb. siltstone.
	10.2	76	100	7								7.10-7.31 sheared and brecc. claystone. 7.31-7.53 weath. grey crumbly granitic sandstone. 7.53-7.70 sheared claystone. 7.70-8.49 granitic sandstone w. some plastic clay matrix. 7.80-7.85 Sample #1, M.C.
				8			MC 22.5					
	11.0	92	100	9								8.49-8.78 sheared and brecc. black carb. siltstone (?) 8.78-8.47 white and yellow completely weath. tuff. 8.47-9.17 sheared siltstone. 9.17-9.60 fresh flow banded str. grey andesite.
				9.60	1112.22							
	12.0	94	100	10								9.60-12.46 mod. to highly weath. jointed cream to buff brown, mod. str. TUFFACEOUS CONGLOMERATE BRECCIA having sheared joints.

Contractor: ..... TONTO .....

Logged by: ... IT .....

Date started: ..... 7 JUNE 78 .....

Checked by: MM .....

Date finished: ... 16 JUNE 78 .....

Date: ... 7 JUNE 78 ..

Remarks: No HW casing installed

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,412 N, 12,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SLIDE AREA (ALEECE LAKE)
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861

Sheet 2 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	10								TUFF, CONGLOMERATE & BRECCIA cont'd
	12.0	94	100						1.3			
				11								11.06-11.44 sheared w. highly plastic clay infilling. 11.24-11.36 Sample #2, Limits.
	13.0	88	98				LL 63.7 PL 34.5					
				12					2.7			
					1109.36							
				12.46								12.46-16.42 *mod. weath., strongly* bedded pale brown med. and c. grained weak GRANITIC SANDSTONE. Micaceous and iron stained.
				13				80				13.04-13.40) 1 cm. thick clay 13.70-13.98) seams.
	16.0	100	100						.7			
				14								14.33-14.38) 1 cm. thick clay 14.45-14.50) seam.
	16.0	100	100				MC 14.0 UCS 982 (142.5)	83	1.3			14.61-15.50 cream to whitish sandstone. 14.64-14.70 Sample #3, M.C. 14.70-14.94 Sample #4, Uniaxial. 15.80-15.84 detrital coal.
				15								
	17.0	92	98						1.3			
				16								
				16.42	1105.40							16.42-24.13 highly weath., bedded, black and pale grey, v. weak, CARBONACEOUS SILTSTONE, CLAYSTONE and GRANITIC SANDSTONE becoming conglomeratic at the bottom of this unit; pervasive shearing and brecc.; occ. pyritic. 16.80-17.83 carb. siltstone. 17.05-18.10 siltstone.
				17								
	15.0	100	100						.7			
				18								18.10-18.45 claystone. 18.45-19.09 weak grey green granitic sandstone.
				19								19.09-19.46 siltstone.
	19.0	88	100				MC 25.7	81	.7			19.81-20.00 Sample #5, Uniaxial. 20.00-20.04 Sample #6, M.C.
				20								

Contractor: TONTO
Logged by: IT
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 7 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH

Coordinates: 76,412 N, 12,203 E

DRILLHOLE No. 78-861
Sheet 3 of 25.

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SLIDE AREA (FLEECE LAKE)

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	20								CARB. SILTSTONE, CLAYSTONE AND SANDSTONE CONT.
	6.5	41	77	21					1.3		L.C.	20.53-20.78 silty sandstone. 20.78-20.92 sandstone. 20.92-21.11 clayey siltstone.
8/6 AM	6.0	90	100	22		3.7	MC 16.0		1.3			21.11-21.32 sandstone. 21.32-21.64 clayey siltstone. 21.64-21.71 sandstone. 21.71-21.86 greyish-brown, sandy siltstone. 21.86-21.92 sandstone. 21.92-22.55 interbedding sandstone and siltstone. 22.40-22.45 Sample #7, M.C. 22.55-24.25 fine to med. silty sandstone of granitic composition w. many shear planes; v. weak to mod. weak, some zones v. friable.
	11.0	46	76	23			MC 10.0		3.3			23.17-23.41 Sample #8, Triaxial. 23.41-23.44 Sample #9, M.C.
				24 24.13	1047.69							24.13-28.40 highly weath., grey and brown, v. weak, sheared and brecc. TUFFACEOUS CONGLOMERATE, TUFFACEOUS SANDSTONE and SILTSTONE (major shear zone). 24.25-24.33 dk. grey, v. weak sheared and brecc., silty claystone, sl. carb. 24.70-24.99 mod. grey to dk. blackish-brown, carb. sheared, sandy siltstone. 25.0- Lost return briefly. 24.99-25.33 lt. grey to lt. brown brecc. tuff., sandy, siltstone w. many pyrite crystals. 25.12-25.20 Sample #10. Att. L. 25.33-26.34 black, sheared, v. weak, silty sandstone w. some pyrite crystals; some brecc., lt. grey, sandy siltstone included. 26.34-26.47 lt. grey, fine silty sandstone; last to cm. v. iron-stained. 26.47-27.57) extremely weath., 27.73-28.13) brecc., rusty orange and green, v. weak, friable, tuff. congl. and congl. tuff. sandstone. 27.57-27.73 extremely weath. rusty orange, brecc. v. weak, friable granodiorite.
	13.0	46	58	25					1.3			
	12.0	100	100	26			LL 65.4 PL 26.0		0			
	12.0	76	86	27								
				28 28.40	1093.42							28.40-52.12 sl. to mod. weath., grey and lt. brown to blackish-brown, v. weak to mod. str., bedded w. some brecc. and shearing, tuff. interbeds of CLAYEY SILTSTONE, SANDY SILTSTONE, SILTY SANDSTONE w. some zones of granitic composed sandstone, some carb. lam. and seams, and some friable zones.
	10.0	90	100	29				65	.7			
				30			LL 96.8 PL 32.4		2.0			28.13-29.32 sl. weath., sl. sheared and brecc., med. grey, mod. weak, tuff. clayey siltstone, some sandy horizons; some pyrite. 28.57-28.65 Sample #12 Att.L.

Contractor: TONTO

Logged by: LT/AH

Date started: 7 JUNE 78

Checked by: MM

Date finished: 16 JUNE 78

Date: 8 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,412 N, 22,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SLIDE AREA (ALEECE LAKE)
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861

Sheet 4 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	30								CLAYEY SILTSTONE, SANDY SILTSTONE, AND SILTY SANDSTONE CONT.
	10.0	90	100					72				29.32-35.36 mod. weath., mass.to bedded, lt. grey and green, mod. weak to mod. str., fine to c. silty sandstone.
												29.80-30.00 Sample #13, Uniaxial/ M.C.
				31			UCS 1835 (266.3)					30.74-30.83 carb. horizon.
	11.0	88	100				MC 10.8		1.3			31.58-31.65 lt. brown and dk.grey beds in sandstone.
												31.91-32.06 med. brown sandstone.
				32			MC 13.0	70				32.31-32.52 Sample #14, Triaxial.
												32.52-32.57 Sample #15, M.C.
	8.0	82	100						2.0			
				33								33.77-33.83 fine carb. sandstone.
												33.90-34.62 some shearing along bedding.
				34								
	11.0	80	100					72	2.0			34.54-34.62 lam., fine silty sand stone.
				35								
												35.36-37.23 sl. weath., bedded (w. some shearing along bedding), lt. brown to blackish-brown, mod. weak, fine silty sandstone w. some carb.lam. and zones.
	9.0	67	100					65				
				36			UCS 3583 (520)		3.3			36.02-36.28 Sample #16, Uniaxial/ M.C.
							MC 15.7					36.28-36.51 med. to c. granitic sandstone.
												37.23-37.87 sl. weath., brecc. lt grey to dk. brownish-grey, weak to mod. weak, sandy siltstone.
				37				63				
	10.0	91	100						1.3			37.87-39.22 sl. weath., mass., med. grey, mod. weak, med. to c. silty sandstone of granodiorite composition; some mod. str. to str. zones.
				38								38.74-38.89 silty fine sandstone w. some carb. material.
								76				
	13.0	82	88	39					2.0			39.22-39.71 sl. weath., bedded (w. some shearing along the bedding) lt. brown to blackish brown mod. weak, fine, silty sandstone w. some carb. zones.
												39.71-39.95 v. sheared, sandy siltstone.
				40								

Contractor: TONTO
Logged by: AH
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 8 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,412 N, 12,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SLIDE AREA (ALEECE LAKE)
Bit: DIAMOND HQ
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861

Sheet 5 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	40								CLAYEY SILTSTONE, SANDY SILTSTONE and SILTY SANDSTONE CONT.
	19.0	64	100	41				63	.7			39.93-47.50 sl. weath., bedded, lt. med. grey, med. to c., mod. weak to mod. str., silty sandstone of granitic composition, some weak zones where poorly cemented. 40.08-40.14 weak, carb. silty, fine sandstone. 40.17-40.37 Sample #17, Triaxial. 40.37-40.40 Sample #18, M.C. 40.73-40.80 weak, carb., silty sandstone; some brecc. 40.88-40.92 weak, silty fine sandstone.
	12.0	94	100	42			MC 15.0	78	2.0			42.06-42.64 lam. silty, fine sand, w. some carb. lam. 42.64-42.82 sheared, carb.clayey siltstone. 42.82-43.00 med. brown, mod.weak sandy siltstone w. some pyrite.
	11.0	97	100	43				76	.7			43.63-43.67 med. brown, weak fine silty sandstone.
	13.0	80	98	44			MC 12.6	66				44.30-44.79 sl. weath., lam.,med. brown, fine silty sandstone. 44.50-44.76 silty sandstone is v. carb. and sheared and brecc. 44.66-44.67 Sample #19, M.C.
	14.0	89	100	45				66	.7			
				46				61				
				47				70	.7			
	11.0	38	96	48			MC 16.8	61	0			46.49-46.60 weak, mod. brown, fine silty sandstone. 46.60-47.50 many carb. lam. and many mod. weak, fine silty sandstone beds within med. to c. sandstone, pyrite crystals along some bedding planes.
				49		6.93		75	2.7			47.50-49.29 sl. weath., med. brown to dk. grey, bedded w. some brecc. and shearing, v. weak to str., sandy, clayey siltstone w. pyrite along many beddings and fract. 48.53-48.95 v. brecc. and sheared v. weak, sandy, clayey siltstone. 48.70-48.80 Sample #20, Att. L. 48.80-48.83 Sample #21, M.C.
8/6 PM	11.0	92	100	50					0			49.29-51.35 sl. weath., bedded med. grey, med. to c. mod. weak to mod. str., silty granitic sandstone, pyrite on fractures.

Contractor: TONTO
Logged by: AH/IT
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 8 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ... ROTARY CORE POLYMER FLUSH ...

Coordinates .....76,412 N.....
.....12,203 E.....

Rig .....LONGYEAR 44 WIRELINE.....

Dip .....90°.....

Location ...SLIDE AREA (FLEECE LAKE)...

Bit .....HQ DIAMOND.....

Azimuth .....

Reference elevation ..DRILL FLOOR.....

DRILLHOLE No. 78-861

Sheet 6 of 25.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	50								CLAYEY SILTSTONE, SANDY SILTSTONE AND SILTY SANDSTONE CONT.
									0			50.40-50.43 carb. siltstone. 51.07-51.15 clayey siltstone.
	12	42	94	51					1.0			51.35-52.12 sl. weath., brown to dk. grey bedded, v. weak to str. sandy clayey siltstone. Pyrite in bedding and fract. 51.60-51.63 Sample #22, M.C. 51.63-51.75 Sample #23, Uniaxial.
	16	66	100	52			MC 15.9		2.0			
				52.12	1069.70							52.12-77.00 sl. weath., med. grey, bedded, weak to mod.str., med. to c. silty GRANITIC SANDSTONE w. minor seams of clayey siltstone and sandy siltstone occ. conglomeratic zone; pyrite in bedding and fract. 52.77-52.84 clayey siltstone. 53.17-53.35 sheared and brecc. 53.45-54.28 weak rock, sheared, slick clay surfaces.
	16	92	100	53					.7			
	16	90	100	54					.7			54.52-54.85 sheared and brecc.
	15	42	100	55								55.35-55.80 sheared and brecc., clayey siltstone. 55.80-56.50 very weak sandstone sheared, clay in fractures.
				56					1.3			56.10-57.00 v. weak sandstone. Pervasive brecc.
	30	100	100	57			MC 16.3		0			57.00-57.68 highly sheared, clayey siltstone. 57.95-58.22 highly sheared, clayey siltstone. Lge. pyrite crystals 57.50-57.55 Sample #24, M.C.
				58								
	20	46	54	59							L.C.	58.90-59.78 highly sheared and brecc., clayey siltstone.
				60								

Contractor: .....TONTO.....

Date started: ....7 JUNE 78.....

Date finished: ...16 JUNE 78.....

Logged by: ...IT....

Checked by: ..MM...

Date: 8 JUNE 78....

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ... ROTARY CORE POLYMER FLUSH ...

Coordinates ..... 76,412 N ..... 12,203 E .....

DRILLHOLE No. 78-861
Sheet 7 of 25

Rig ..... LONGYEAR 44 WIRELINE .....

Dip ..... 90° .....

Location ... SLIDE AREA (ALEECE LAKE) ...

Bit ..... HQ DIAMOND .....

Azimuth .....

Reference elevation .. DRILL FLOOR .....

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				60								GRANITIC SANDSTONE CONT
	18	100	100	61			MC 12.4 UCS 1902 (276)	83	0			60.44-60.79 sandy siltstone. 60.32-60.35 Sample #25, M.C. 60.35-60.60 Sample #26, Uniaxial. 60.50-62.70 str. granitic sandstone.
	18	100	100	62					.7			
	17	92	100	63			MC 23.4		0			62.85-63.92 highly sheared and brecc., clayey siltstone, pyrite. 63.33-63.37 Sample #27, M.C.
9/6 AM	10	46	100	64		-9.60			1.3			64.74-65.23 silty fine sandstone and sandy siltstone w. some shearing and brecc. 65.84-67.50 shearing in sandstone v. weak.
	12	100	100	65					0			66.65-66.90 Sample #28, Uniaxial/M.C.
	10	78	88	66				78				67.20-68.08 conglomeratic sandstone.
				67								
				68				77	2.0			68.08-68.70 fine to med., silty sandstone w. interbedding sandy siltstone.
	10	80	92	69					0			69.17-69.51 pale grey to pale green, mod. weak, sandy, clayey siltstone. 69.89-71.66 lt. grey to pale green, brecc., weak, clayey siltstone w. some fine to c. sandstone interbeds and some shearing
				70				88				

Contractor: TONTO

Logged by: IT/AH

Remarks:

Date started: 7 JUNE 78

Checked by: MM

Date finished: 16 JUNE 78

Date: 9 JUNE 78

Golder Associates

Scale: 1:50 metric

Type of drilling ... ROTARY CORE POLYMER FLUSH ...

Coordinates ... 76,412 N ... 12,203 E ...

Rig ... LONGYEAR 44 WIRELINE ...

Dip ... 90° ...

Location ... SLIDE AREA (ALEECE LAKE) ...

Bit ... BQ DIAMOND ...

Azimuth ...

Reference elevation ... DRILL FLOOR ...

DRILLHOLE No. 78-861

Sheet 8 of 25

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				70								GRANITIC SANDSTONE CONT.
	10.0	80	92				LL 134.0 PL 34.0 MC 16.7					70.12-70.21 Sample #29, Att. L. 70.21-70.24 Sample #30, M.C. 70.50-71.60 some shearing.
	12.0	100	100	71					0			71.26-71.47 Sample #31, Triaxial. 71.47-71.49 Sample #32, M.C.
	10.0	92	92	72					0			72.08-72.12 brecc., v. weak, clayey sandy siltstone. 72.36-73.13 mod. str., interbedding silty fine sandstone and silty med. sandstone; some shearing.
				73								73.13-73.73 str., med. to c. sandstone. 73.73-73.86 v. weakly cemented, med. to c. sandstone. 73.86-74.55 mod. grey, mass., mod. str. to str., sandy siltstone.
	11.0	82	100	74			MC 8.6	83	.7			74.13-74.17 Sample #33, M.C. 74.76-75.64 mod. str., silty, fine to med. sandstone.
9/6 PM	20.0	88	94	75					0			75.64-75.98 med. grey, weak sandy siltstone. 76.17-76.76 v. weak, silty sandstone. 76.76-77.00 mod. str., silty sandstone.
				76								
					1044.82							
				77.00								77.00-82.92 mod. weath., gently but pervasively disturbed - bedding prominent but inconsistent - weak mainly CARBONACEOUS CLAYEY SILTSTONE. Thin lam. of detrital coal; minor sandstone; tuff. 77.00-77.02 pale brown ash band. 77.00-77.06 Sample #34, Limits. 77.06-77.09 Sample #35, M.C. 77.40-77.68 grey, v. weak brecc., clayey, sandy siltstone. 77.70-78.39 thin lam. of black shiny coal within carb. siltstone. 78.45-78.83 sheared and brecc., silty sandstone.
	22.0	100	100						0			
				78								
	29.0	100	100				MC 23.2		0			
				79								
				80								

Contractor: TONTO

Date started: 7 JUNE 78

Date finished: 16 JUNE 78

Logged by: AH/IT

Checked by: MM

Date: 9 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH

Coordinates 76,412 N
12,203 E

DRILLHOLE No. 78-861
Sheet 9 of 25

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location SLIDE AREA (FLEECE LAKE)

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	80								CARBONACEOUS SILTSTONE CONT.
	13.0	100	100	81			MC 21.6	86	0			79.80-80.28) white speckled tuff. 80.63-81.50) siltstone. 80.63-80.87 Sample #36, Triaxial. 80.87-80.91 Sample #37, M.C. 80.91-81.01 Sample #38, Att. L.
	24.0	100	100	82				80 60 76	0			81.50-81.84 sandy siltstone. 81.84-82.92 sandy carb. siltstone rubbly brecc. texture. 82.16-82.30 ash band, 1 cm.thick oblique to C.A. 82.60-82.69 med. green, clayey siltstone. 82.69-82.92 pale brown, clayey tuff. siltstone.
				82.92	1038.90							82.92-101.04 mod. weath., med. green, poorly bedded, mod. str., silty fine to med. GRANITIC SANDSTONE and SANDY SILTSTONE w. some conglomeratic zones.
	23.0	100	100	83					.7			83.02-83.09) med. green, clayey 83.19-83.25) siltstone. 83.63-83.75)
				84			UCS 282.5 (41)					83.14-83.28 Sample #39, Uniaxial. 83.85-84.24 green grey, mod. str. congl.
10/6 AM						-9.65						84.24-85.95 sl. weath., mass., green, mod. weak, silty fine to med. sandstone w. some clay and some congl. areas.
	13.0	100	100	85					0			85.35-85.44 Sample #40, Att. L. 85.56-85.62 brecc., sandy siltstone. 85.65-85.85 Sample #41, Uniaxial/M.C.
				86			UCS 516.8 (75) MC 20.6					85.95-89.43 sl. weath., mass., med. green, mod. weak to mod.str. fine to med. congl.; subangular to subrounded basalt, andesite and rhyolite gravels in a silty fine to c. sandstone matrix; many breaks along clast/matrix boundaries.
	13.0	100	100	87					0			87.17-88.70 poor recovery due to a mislatch.
	16.0	0	22	88					0		L.C.	
				89								89.20-89.43 some aphanitic green, siliceous matrix. 89.43-90.12 mod. str., mass., silty, fine to med. sandstone and sandy siltstone, occ. small gravel.
	13.0	100	100	90			MC 22.8		0			89.60-89.80 Sample #42, Triaxial. 89.80-89.83 Sample #43, M.C.

Contractor: TONTO

Logged by: LT/AH

Remarks:

Date started: 7 JUNE 78

Checked by: MM

Date finished: 16 JUNE 78

Date: 10 JUNE 78

Golder Associates

Scale: 1:50 metric

Type of drilling .... ROTARY.CORE.POLYMER.FLUSH ..

Coordinates 76,412 N 12,203 E

Rig .....LONGYEAR.44 WIRELINE .....

Dip .....90°.....

Location ..SLIDE AREA.(ALEECE LAKE)....

Bit .....HQ DIAMOND.....

Azimuth .....

Reference elevation ...DRILL FLOOR....

DRILLHOLE No. 78-861

Sheet 10. of 25..

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	90								GRANITIC SANDSTONE and SANDY SILTSTONE CONT.
	13.0	100	100									90.12-90.54 weak, silty fine sandstone.
	15.0	94	100	91			LL 92.9		.7			90.54-91.26 weak to mod. weak, brecc., clayey siltstone and sandy siltstone; some shearing. 90.86-90.96 Sample #44, Att. L. 91.26-92.41 mod. weak to mod.str. sandy siltstone. 91.78-91.86 med. sandstone. 91.89-92.09 Sample #45, Uniaxial/ M.C.
	14.0	100	100	92			UCS 475.5 (69) MC 28.7	78	0			92.41-93.16 conglomeratic, silty sandstone.
				93								93.16-93.31 mod. str., silty fine sandstone. 93.31-93.58 sandy siltstone. 93.58-94.57 clayey siltstone w. some brecc., some sl. sandy horizons.
	12.0	88	100	94					0			94.57-95.14 sandy siltstone. 95.14-95.77 mod. str. conglomeratic fine to med. silty sandstone.
	13.0	100	100	95			MC 34.0		0			95.77-96.32 mod. weak to mod.str. brecc., clayey siltstone w. some fine sand and poss. sheared (but retains strength). 95.83-96.03 Sample #46, Triaxial. 96.03-96.20 Sample #47, Triaxial. 96.20-96.23 Sample #48, M.C. 96.32-97.05 weak, brecc., w. some shearing, clayey siltstone w. tr. of sand.
	16.0	96	100	96					0			97.05-97.55 sandy siltstone and silty fine sandstone. 97.55-97.65 brecc., sheared, silty claystone. 97.65-98.22 conglomeratic, silty fine to med. sandstone.
	14.0	100	100	97					0			98.22-98.67 mod. weak, sandy claystone w. some brecc. 98.67-99.61 mod. weak, sandy silt stone and silty sandstone w. some brecc. and some conglomeratic areas. 98.83-99.03 Sample #49, Uniaxial/ M.C. 99.61-101.04 mod. weak green sandy siltstone and silty sandstone w. thin (0.5 cm) green clay seams at 10 cm intervals. Some brecc.; probably drill breaks.
10/6 PM	16.0	100	100	98			UCS 454.8 (66) MC 38.3					
				99								
				100								

Contractor: .....TONTO.....

Date started: .....7 JUNE 78.....

Date finished: ....16 JUNE 78.....

Logged by: AH/LT...

Checked by: MM.....

Date: 10 JUNE 78....

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,412 N, 12,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SLIDE AREA (ALEECE LAKE)
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861

Sheet 11 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	100								GRANITIC SANDSTONE and SANDY SILTSTONE CONT.
	10.0	100	100					85	0			
				101								
				101.4								101.04-105.75 sl. weath., mass., mottled grey green, mod. weak to mod. str. fine to c. CONGLOMERATE. Subangular and rounded volc. and silty sandstone clasts. Silty sandstone matrix.
	12.0	100	100						0			
				102								
							UCS 268.7 (39)					102.53-102.78 Sample #50, Uniaxial M.C.
	10.0	100	100				MC 12.6					
				103					0			103.06-103.70 soft grey, clay within matrix.
				104								
	10.0	100	100						0			
				105								
				105.75	1016.07							
	12.0	100	100	106					0			105.75-123.45 mod. weath., med. green poorly bedded, mod. str., CLAYEY, SANDY SILTSTONE and SILTY SANDSTONE becoming conglomeratic at the bottom of the unit.
												106.80-108.02 1.2m run gives 1.52 m. Core smeared w. green clay and mainly pseudo clay seams (core wasted by drilling process).
												106.80-106.24 Sample #51, Triaxial
												106.24-106.32 Sample #52, M.C.
	14.0	100	100	107			MC 31.3		0			
												107.94-108.67 str. sandy siltstone.
				108								
	17.0	100	100						0			
				109								
	17.0	100	100									
				110								

Contractor: TONTO
Logged by: IT
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 10 JUNE 78

Remarks: RQD in siltstone is theoretically 100%
Core is rotated during drilling and rehealed.

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY.CORE.POLYMER.FLUSH

Coordinates 76,412 N
12,203 E

Rig LONGYEAR.44.WIRELINE

Dip 90°

Location SLIDE AREA (ALEECE LAKE)

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

DRILLHOLE No. 78-861

Sheet 12 of 25

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				110								CLAYEY, SANDY, SILTSTONE and SILTY SANDSTONE CONT.
	11.0	100	100				MC 27.5		0			109.42-110.03 green, med. grain mod. str., silty sandstone. 110.10-110.15 Sample #53, M.C. Rotated Drill Core.
	14.0	100	100	111					0			
	13.0	100	100	112			MC 33.9		0			113.38-114.06 med. green, mod. str., silty sandstone. 113.50-113.53 Sample #54, M.C.
	13.0	100	100	113					0			114.82-115.50 med. green, mod. str., med. to c. grain silty sandstone. Mass.;rotated drill Core.
	14.0	100	100	114					0			
	14.0	100	100	115			MC 27.3		0			117.50-117.53 Sample #55, M.C.
	14.0	100	100	116					0			118.82-119.10 green, mod. str., med. to c. grain sandy siltstone. Rotated Drill Core.
	15.0	100	100	117					0			
				118								
				119								
				120								

Contractor: TONTO

Logged by: IT

Date started: 7 JUNE 78

Checked by: MM

Date finished: 16 JUNE 78

Date: 10 JUNE 78

Remarks: RQD: Siltstone core rotated and rehealed.

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER/MUD FLUSH
Coordinates: 76,412 N, 12,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:
Location: SLIDE AREA (ALEECE LAKE)
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861

Sheet 13 of 25.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	120								CLAYEY, SANDY, SILTSTONE AND SILTY SANDSTONE CONT.
											L.C.	Core lost due to driller grinding core.
	14	30	82	121					0			
	16	30	100	122					0			122.07-122.17 green, silty sandstone. 122.27-122.35 conglomeratic siltstone; small rounded gravel clasts.
11/6 AM	12	100	100	123		-3.02	UCS 2418 (351) MC 39.0		0			122.62-122.83 Sample #56, Uniaxial M.C. 122.85-122.93 Sample #57, Att. L.
				123.45	998.37							123.45-134.72 sl. weath., mass., med. greenish-grey, med. to c., moderately str., VOLCANIC BRECCIA; subrounded to angular basalt clasts w. a sandy to clayey siltstone matrix; generally clast supported; many breaks along clast/matrix boundaries, some green, aphanitic, siliceous matrix.
	14	100	100	124					0			
	12	30	100	125					4.0			125.18-126.47 lge. flow basalt, section in breccia, some fract. have a med. green silty clay along them.
				126								
	18	0	24	127					0		L.C.	126.49-128.02 poor recovery due to mislatch.
	12	0	100	128					0			
11/6 PM	20	0	100						0			
	20	0	100	129					3.5			129.16-130.55 volc. rock highly fract. but unbrecc.
				130								

Contractor: TONTO
Logged by: IT/AH
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 11 JUNE 78

Remarks: Core to 123 m. rotated but rehealed by clay bands. Switched to Quik TROL and QUIK GEL @ 128.32.

Golder Associates

Scale: 1:50 metric

Type of drilling ... ROTARY CORE MUD FLUSH .....
Coordinates .....76,412 N.....
.....12,203 E.....
Rig .....LONGYEAR 44 WIRELINE.....
Dip .....90°.....
Location ...SLIDE AREA (ALEECE LAKE)...
Bit .....HQ DIAMOND.....
Azimuth .....
Reference elevation ..DRILL FLOOR.....

DRILLHOLE No. 78-861

Sheet 14 of 25.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	130								VOLCANIC BRECCIA CONT.
	2.0	26	92	131					0			130.55-131.48 v. weak, c. volc. breccia.
	1.0	48	98	132					2.0			131.48-131.87 Unbrecciated, v. str., grey green basalt.
	1.0	86	100	133			UCS 11466 (1664)		0			133.70-133.95 Sample #58, Uniaxial/M.C.
				134	987.10							
	1.0	0	100	134.72					7.5			134.72-148.90 fresh joint, highly fract dk. grey, v. fine, v. str., BASALT one persistent joint set at 70-75°, spaced every 2-5 cm w. a white-pink infilling, other fract. are infilled w. a green silty claystone and occ. silty sandstone.
	2.5	0	100	135					0			ground v. blocky, drilling only short runs.
	2.5	0	66	136					0			
	2.5	0	50						0		L.C.	
	2.5	0	95						0			
	2.5	0	100	137					6.6			
	2.5	0	75						0			137.77-138.75 rubbly basalt.
12/6 AM		0	67	138		-2.56			0			
	10.0	0	71						0			138.83-138.98 volc. breccia; basalt clasts in a silty sandstone matrix.
	12.0	35	76	139					2.2			139.63-140.29 brecc. flow basalt w. a grey green, silty claystone infilling; rehealed fract. at 75° to C.A.; v. rubbly.
	25.0	0	91	140							L.C.	

Contractor: .....TONTO.....
Logged by: ..JT/AH..
Date started: .....7 JUNE 78.....
Checked by: MM
Date finished: ....16 JUNE 78.....
Date: ..12 JUNE 78..

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 76,412 N, 12,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:
Location: SLIDE AREA (ALEECE LAKE)
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861
Sheet 15 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50									FRACTURED BASALT CONT.
	25.0	0	91	140								
	18.0	57	100						0			140.50-140.73 v. brecc. and rubbly.
				141								
	18.0	57	94						6.0			
				142								
	13.0	36	89						3.0			142.80-143.15 brecc. basalt w. a silty clayey sandstone infilling.
				143								143.26-143.61 rubble.
	16.0	0	100						9.0			
				144								
	16.0	67	100						7.0			144.72-147.60 brecc. basalt infilled w. a v. weak, dull green claystone and sandy claystone; v. rubbly.
				145								
	9.0	0	47									
				146							L.C.	
	10.0	0	12	147					3.2		L.C.	147.76-148.47 brecc. basalt infilled w. a weak, dull green claystone and sandyclaystone. 148.47-148.90 some hematitic alteration in the basalt.
	10.0	57	89	148					0			
	23.0	0	81		972.92							
				148.90								148.90-151.96 mod. weath., mass., mottled rust, green, off white, str., VOLCANIC/CLAYSTONE BRECCIA w. basalt, hematized rhyolite & tuff. clasts in a dull green silty claystone or sandy claystone matrix; clast supported. Also red brown baked claystone matrix?
				149								
	16.0	88	100						0			
12/6 PM	27.0	50	88	150					0			

Contractor: TONTO
Logged by: AH/IT
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 12 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling .... ROTARY. CORE. MUD. FLUSH. ...

Coordinates 76,412 N
12,203 E

DRILLHOLE No. 78-861
Sheet 16. of 25.

Rig ..... LONGYEAR. 44 WIRELINE .....

Dip ..... 90° .....

Location ..SLIDE AREA. (ALEECE. LAKE).....

Bit ..... DIAMOND HQ .....

Azimuth .....

Reference elevation ...DRILL FLOOR. ...

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	150								VOLCANIC/CLAYSTONE BRECCIA CONT.
	27.0	50	88						0			149.66-149.86 angular, fresh grey v. str., basalt frag. in a silty claystone matrix.
				151								151.67-151.96 angular basalt angular claystone and baked claystone frags. in a green clayey silt matrix.
	72.0	56	100									
				151.96	969.86				0			151.96-202.75 sl. to mod. weath., med. green to greyish-green, mod. str. to str., interbedded seams of SILTY CLAYSTONE, SANDY SILTSTONE and SILTY SANDSTONE; occ. conglomeratic horizons, some sandstone composed of granitic materials.
				152								151.96-153.10 red brown mottled appearance due to baked silty claystone.
	76.0	62	90	153					0			152.50-153.05 brecc. core reheal-ed by pale green clay.
				154								154.30-154.57 Sample #59, Uniaxial M.C.
	72.0	96	100				UCS 1261 (183) MC 28.1		0			154.50- gradational change to clayey siltstone.
				155								
	75.0	95	100	156					.7			Core getting "waisted" during drilling.
	25.0	0	0	157					0		L.C.	
	25.0	0	0	158					0			158.65-158.80 sl. weath., mass., med. greyish-green, mod. str., to str., sandy clayey siltstone.
	25.0	0	50			-24.02						158.80-160.45 clayey siltstone w. tr. fine sand and sandy clayey siltstone.
13/6 AM				159								
	33.0	100	100						.7			
				160								

Contractor: TONTO

Logged by: AH/IT

Remarks:

Date started: 7 JUNE 78

Checked by: MM

Date finished: 16 JUNE 78

Date: 13 JUNE 78

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,412 N, 12,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SLIDE AREA (ALEECE LAKE)
Bit: DIAMOND HQ
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861
Sheet 17 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	160								SILTSTONE, CLAYSTONE & SANDSTONE CONT.
	13.0	100	100									160.03-160.24 Sample #60,Triaxial 160.24-160.26 Sample #61, M.C. 160.24-161.85 str., clayey siltstone, occ. joint shows some shearing; some horizons have tr. of fine sand; the fine sand is generally micaceous.
	16.0	98	98	161			MC 39.4		1.3			
	15.0	98	100	162			UCS 355.5 (516)		.7			161.23-161.44 Sample #62,Uniaxial M.C. 161.44-161.54 Sample #63, Att. L. 161.85-165.78 str. clayey siltstone w. tr. of fine sands; the fine sand is generally micaceous.
	16.0	100	100	163								
	13.0	100	100	164					0			164.16-164.20 Sample #64, M.C. 164.20-164.42 Sample #65,Triaxial
	16.0	100	100	165			MC 29.0		0			
	18.0	100	100	166					0			165.78-168.10 mod. str., to str. med. green, mass., sandy, clayey siltstone.
				167								
	18.0	100	100	168			UCS 5002 (726) MC 22.2		.7			167.86-168.10 Sample #66,Uniaxial M.C. 168.00-168.25 conglomeratic fine to med. sandstone.
13/6 PM	22.0	100	100	169					0			
				170								169.60-173.64 sl. weath., mass., med. green, v. str., silty sandstone, occ. fine gravel.

Contractor: TONTO
Logged by: AH/IT
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 13 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling .... ROTARY.CORE.MUD.FLUSH.....

Coordinates 76,412 N
12,203 E

Rig .....LONGYEAR.44.WIRELINE.....

Dip .....90°.....

Location ...SLIDE.AREA.(ALEECE.LAKE)...

Bit ..... HQ DIAMOND .....

Azimuth .....

Reference elevation..DRILL.FLOOR.....

DRILLHOLE No. 78-861

Sheet 18 of 25.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	170								SILTSTONE, CLAYSTONE & SANDSTONE CONT.
	25.0	100	100	171					0			
	25.0	100	100	172			MC 12.2		0			171.77-171.80 Sample #67, M.C.
	27.0	88	100	173					.7			173.64-173.82 sl. weath., mass., med. green, mod. str., sandy, clayey siltstone. 173.82-174.73 mod. to v. str., silty sandstone.
	22.0	100	100	174				68				174.73-175.80 sl. weath., finely interbedded pale and med. green, mod. str., sandy clayey siltstone and silty fine grain sandstone.
				175			UCS 2336 (339)		0			175.42-175.57 Sample #68, Uniaxial M.C.
	20.0	100	100	176				72	3.3			NOTE: mainly silty fine to med., sandstone below this depth w. occ. conglomeratic or siltstone horizons.
	21.0	94	100	177								177.20-180.08 mod. to v. str., silty sandstone. Occ. pebbles.
				178					3.0			
	24.0	100	100	179					0			
				180								

Contractor: ..... TONTO .....

Logged by: ...LT.....

Date started: .....7 JUNE.78.....

Checked by: MM

Date finished: ....16 JUNE.78.....

Date: ..13 JUNE.78..

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 76,412 N, 12,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:
Location: SLIDE AREA (ALEECE LAKE)
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861
Sheet 19 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	180								CLAYSTONE, SILTSTONE & SANDSTONE CONT.
	18.0	95	100	181					0			180.08-180.68 slightly weath., mass., green, white and pink mottled med. grain mod. str., congl., silty sand matrix. 180.68-100.90 Sample #69,Triaxial 180.68-183.60 green, mod. str., silty sandstone, w. minor interbedded sandy, clayey siltstone.
	20.0	100	100	182					0			
	20.0	100	100	183					0			183.60-183:93 interbedded sl. weath., med. green, mod. str., to str. c. silty sandstone.
14/6 AM	11.0	81	98	184		-5.61			2.0			185.06-185.41 conglomeratic sandstone. 185.51-185.78 sandy siltstone. 185.96-187.10 mass., mod. str., to str., clayey siltstone w. tr. sand. 186.20-186.45 Sample #70,Uniaxial M.C.
	17.0	88	99	185			MC 19.3		.7			186.97-187.08 some shearing and brecc.
	13.0	79	100	186				35	.7			187.10-187.26 silty, med. to c. sandstone. 187.68-188.08 conglomeratic sandstone. 188.39-188.72 brecc., clayey siltstone w. some shearing. 188.72-189.10 conglomeratic silty sandstone.
	12.0	96	100	187					0			189.19-189.49 sandy siltstone. 189.61-190.91 conglomeratic, silty fine to med. sandstone; some sandy siltstone clasts up to coarse gravel size.
				188								
				189								
				190								

Contractor: TONTO
Logged by: IT/AH
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 14 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling .... ROTARY CORE MUD FLUSH .....
Coordinates .... 76,412 N .....
12,203 E .....
Rig ..... LONGYEAR 44 WIRELINE .....
Dip ..... 90° .....
Location ... SLIDE AREA (ALEECE LAKE) ...
Bit ..... HQ DIAMOND .....
Azimuth .....
Reference elevation ... DRILL FLOOR ...

DRILLHOLE No. 78-861

Sheet 20 of 25.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	190								CLAYSTONE, SILTSTONE & SANDSTONE CONT.
	21.0	96	100				MC 8.5					190.06-190.10 Sample #71, M.C. 190.10-190.32 Sample #72,Triaxial
	14.0	93	100	191					0			
				192								192.10-192.39 weakly cemented, med. to c. sandstone. 192.39-193.61 mod. str., silty, v. fine sandstone.
		50	100	193					1.3			193.44-193.66 brecc. sandstone.
		98	98	194				88	0			194.11-194.52 silty, med. to c. sandstone. 194.92-200.26 mod. weath., mass., med. greyish-green, str., med. to c. silty granitic sandstone.
				195			UCS 5085 (738)					
	10.0	100	100	196					0			195.77-195.97 Sample #73,Uniaxial M.C.
												196.67-196.91 silty, fine sandstone.
	10.0	95	95	197					.7			
				198								
	11.0	100	100				MC 11.8		0			198.88-198.91 Sample #74, M.C. 198.91-199.11 Sample #75,Triaxial
				199								199.39- some med. to c. gravel size sandy siltstone clasts within the sandstone.
	15.0	84	98	200								

Contractor: TONTO
Logged by: AH
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 14 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling .... ROTARY.CORE.MUD.FLUSH.....

Coordinates 76,412 N
12,203 E

Rig .....LONGYEAR.44 WIRELINE.....

Dip .....90°.....

Location ...SLIDE AREA(ALEECE LAKE).....

Bit .....HQ DIAMOND.....

Azimuth .....

Reference elevation ...DRILL FLOOR....

DRILLHOLE No. 78-861

Sheet 21 of 25.

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				200								CLAYSTONE, SILTSTONE & SANDSTONE CONT.
	15.0	84	98	201					2.6			200.26-202.75 sl. weath., mass., med. green, mod. str., to str., sandy siltstone, tr. of clay. 200.39-200.51 some silty fine sandstone interbeds. 200.26-201.61 some shearing and brecc. 201.61-202.75 rusty red. colour within rock along some horizons; some shearing and brecc
	16.0	90	100	202			UCS 916 (133)		2.0			202.22-202.48 Sample #76,Uniaxial M.C.
				202.75	919.07							
14.6 PM	29.0	100	100	203		-7.06			0			202.75-206.80 sl. weath., mass., med. green, mod. str. to str., calcite cemented, CONGLOMERATE; sandy siltstone matrix, rounded and subangular siltstone clasts.
	23.0	8	100	204					0			204.37-206.80 congl. w. pale red brown silty clay matrix and brown carb (?) silty claystone clasts. 204.37-205.89 core rotated and rehealed w. brown clay seams.
				205								205.12-205.40 Sample #77,Triaxial.
	33.0	64	100	206								
				206.80	915.02				0			206.80-217.50 sl. weath., mass., dull med. green and red brown, str.,silty CLAYSTONE. Calcite w. rehealed fract. planes; some concoidal surfaces; bordering on an argillite.
	29.0	85	100	207								
				208					.7			
	23.0	91	100	209								
				210					1.3			

Contractor: TONTO

Logged by: AH/IT

Date started: 7 JUNE 78

Checked by: MM

Date finished: 16 JUNE 78

Date: 14 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ... ROTARY CORE MUD FLUSH ...

Coordinates ... 76,412 N ... 12,203 E ...

Rig ... LONGYEAR 44 WIRELINE ...

Dip ... 90° ...

Bit ... HQ DIAMOND ...

Azimuth ...

Location ... SLIDE AREA (ALEECE LAKE) ...

Reference elevation ... DRILL FLOOR ...

DRILLHOLE No. 78-861

Sheet 22 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D. 0 50	Core Recovery % 0 50	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				210								SILTY CLAYSTONE CONT.
		91	100						1.3			210.40-211.10 highly calcitic claystone.
	26.0	77	98	211					2.3			211.10-213.51 v. weak, predominately brown green carb. claystone. Highly fract.
							MC 16.7					211.40-211.45 Sample #78, M.C.
	27.0	72	100	212					3.3			
				213								213.51-214.00 Sample #79, Uniaxial M.C.
		69	100	214					3.3			
15/6 AM				215		-1.55						
		62	100	216					3.3			216.60- chlorite along a fract.
		86	100	217			UCS 489 (71)					217.12-217.50 v. sheared and brecc. clayey siltstone. 217.34-217.56 Sample #80, Uniaxial M.C.
				217.5	904.32				2.7			217.50-230.28 mod. weath., blue-green to olive green and dk. brown, weak to mod. str., bedded CLAYEY SILTSTONE some shearing and brecc., some limonite and hematite staining and alteration, occ. white and pale green carbonate infilling along fract.
							MC 23.2					
				218				75				217.50-220.13 thickly bedded, med. brown, clayey siltstone, some limonite staining. 217.50-218.30 sheared. 218.22-218.30 v. brecc. and sheared. 218.58-218.63 interbedding fine silty sandstone. 219.05-219.12 interbedding, fine silty sandstone; lam. 219.78-219.88 lam. fine sandstone w. limonitic staining.
		64	100	219				76	2.0			
		88	100	220				84				

Contractor: ... TONTO ...

Logged by: ... IT/AH ...

Date started: ... 7 JUNE 78 ...

Checked by: MM ...

Date finished: ... 16 JUNE 78 ...

Date: 15 JUNE 78 ...

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ... ROTARY CORE MUD FLUSH ..... Coordinates ..... 76,412 N ..... 12,203 E .....

DRILLHOLE No. 78-861
Sheet 23 of 25

Rig ..... LONGYEAR 44 WIRELINE ..... Dip ..... 90° ..... Location ... SLIDE AREA (FLEECE LAKE) ....

Bit ..... HQ DIAMOND ..... Azimuth ..... Reference elevation .. DRILL FLOOR .....

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	220								CLAYEY SILTSTONE CONT.
		88	100	221			MC 18.5		2.0			220.12-228.48 mod. weath., brecc. dk. blue-green, mod. str. to str. clayey siltstone some hematitic alteration; shearing, nearing an argillite, some conchoidal surfaces. 220.87-221.09 Sample #81, Uniaxial 221.09-221.11 Sample #82, M.C.
		98	98	222					.7			222.66-223.76 purplish brown, siltstone, v. brecc. for first 10 cm.
		51	100	223					2.0			
		38	98	224								
				225					2.0			225.23-225.72 v. brecc. siltstone
		84	100	226					1.3			
15/6 PM				227								227.30-227.64 v. brecc. siltstone
	23.0	64	100	228					2.0			228.50-228.60 hematitic alteration. 228.80-228.98 hematitic alteration. 228.98-230.28 mod. weath., brecc. and sheared, dull brown to olive green. Weak clayey siltstone. 229.40-229.56 highly sheared. 229.92-229.96 tr. sand in bedding
	21.0	16	98	229					.7			
				230				81				

Contractor: TONTO Logged by: AH/IT

Date started: 7 JUNE 78 Checked by: MM

Date finished: 16 JUNE 78 Date: 15 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 76,412 N, 12,203 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SLIDE AREA (ALEECE LAKE)
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-861

Sheet 24 of 25

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	230								CLAYEY SILTSTONE CONT.
		16	98	230.28								230.28-233.77 sl. weath. well bedded pale green and grey, fine to c., weak to mod. weak SILTY SANDSTONE becoming finer grained at bottom of unit. Clay veneer on occ. bedding planes and in fracts.
	17.0	52	100	231					1.3			231.28-231.43 Sample #83, Uniaxial M.C.
												231.90-232.37 many fine (1mm) clay interbeds w. fine grain sandstone shiny surfaces.
	19.0	36	100	232				86	.7			232.48-232.55 fine clay and pale siltstone interbeds.
				233								233.30-233.50 sheared, dk. grey claystone and sandstone interbeds
	18.0	28	100	234			MC 9.2		.7			233.77-234.50 sl. weath., sheared and brecc. grey-brown, v. weak, silty claystone. White carbonate rehealing breccia.
												234.46-234.49 Sample #84, M.C.
				234.50	887.32							234.50-249.94 E.O.H. sl. to mod. weath dk. blue-green and dk. brown, brecc. to mass., weak to str., fine grain, CLAYEY SILTSTONE some shearing and brecc., some shaley partings and lam. occ. white and pale green carbonate infilled fracts., some conchoidal fract. surfaces.
	23.0		100	235					0			234.50-239.97 v. argillaceous mainly rotated drilling breaks.
				236								only getting 50% return.
16/6 AM						-26.67						
	7.0	27	100	237					1.3			
	16.0	28	100	238				85				238.06-239.97 siltstone is lam. and banded; blue-green and dk. brown interbedding siltstone.
								78	2.6			238.90-239.60 dk. brown, weak, v. brecc. and sheared siltstone.
	23.0	39	100	239					1.5			239.37-239.46 med. green, granitic sandstone.
												239.60-239.73 bedded, lt. brown, fine sandstone and dk. brown silt stone.
				240				75				239.82-239.92 Sample #85, Att. L.
												239.92-239.97 Sample #86, M.C.

Contractor: TONTO
Logged by: IT/AH
Date started: 7 JUNE 78
Checked by: MM
Date finished: 16 JUNE 78
Date: 16 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling .... ROTARY.CORE.MUD.FLUSH.....

Coordinates 76,412 N
12,203 E

Rig .....LONGYEAR.44.WIRELINE.....

Dip .....90°.....

Location .....SLIDE.AREA.(ALEECE.LAKE)

Bit .....HQ.DIAMOND.....

Azimuth .....

Reference elevation ..DRILL.FLOOR.....

DRILLHOLE No. 78-861
Sheet 25 of 25.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	240								CLAYEY SILTSTONE CONT.
	23.0	38	100									239.97-249.97 weath., mass., dk. brown, str., clayey siltstone; some shaley partings and lam.
								67				240.59-240.74 sandy siltstone.
												240.74-240.76 v. sheared and brecc.
	14.0	33	100	241					1.6			241.08-241.77 brecc. w. some shearing.
								83				241.77-241.90 lt. brown, silty fine sandstone w. some carbonate infilled fract.
												241.90-242.15 sandy siltstone.
												242.15-242.30 lt. brown, silty fine sandstone.
				242								242.80-242.95 v. sheared and brecc. siltstone; immediately below the shearing, some of the siltstone is grey-green in colour
	21.0	30	100					65	4.0			
				243								243.10-243.23 brecc. w. some shearing.
												243.23-243.39 v. str., lam. fine silty sandstone and siltstone (clast).
	22.0	77	100					75	0			243.39-243.93 extremely sheared and brecc. siltstone; v. weak.
				244								243.93-244.15 v. str., silty sandstone w. some carbonate infilling fract. (clast?)
												244.15-246.24 extremely sheared and brecc. siltstone, some chlorite along joints.
	21.0	80	100						2.9			244.64-244.66 Sample #87, M.C.
				245								244.66-244.76 Sample #88, Att. L.
												245.37-245.55 v. str., sandy siltstone.
							MC 14.7					245.83-245.97 fine sandstone clast.
				246								246.15-246.24 sandy siltstone.
	20.0	18	100						6.0			246.24-249.72 brecc. and sheared clayey siltstone (not as broken up as immediately overlying siltstone).
								85				
				247								247.38-247.46 lam., lt. green sandy siltstone.
								65				
	16.0	46	94						2.0			
				248								248.85-248.87 Sample #89, M.C.
												248.98-249.72 sl. weath., med. green, silty sandstone w. some sandy siltstone and many carbonate infilled fracts.
							MC 19.3					249.72- sheared and brecc. clayey siltstone.
				249								
	20.0	20	100						2.3			
					871.88							
				249.94								249.94 END OF HOLE.
				250								

Contractor: .....TONTO.....

Logged by: ...AH....

Date started: .....7. JUNE 78.....

Checked by: .....

Date finished: .....16. JUNE 78.....

Date: 16. JUNE 78....

Remarks: Hole surveyed at 249.9 88°/178°

Golder Associates

Scale: 1:50
metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 77,277 N, 14,345 E

DRILLHOLE No. 78-866
Sheet 1 of 6

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SLIDE AREA (LAKE)

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	0	1068.78							
18/6 AM				0.40	1068.38							Triconed 0.40 to 97.92 m (see log of 78-857)
				1								
				2								
				3								
				4								
				5								
				6								
				7								
				8								
				9								
				10								

Contractor: TONTO

Logged by: AH

Date started: 18 JUNE 78

Checked by: RE

Date finished: 22 JUNE 78

Date: 18 JUNE 78

Remarks: FINAL HW CASING DEPTH 99.67 m.

Golder Associates

Scale: 1:50 metric

Type of drilling ... ROTARY CORE MUD FLUSH ....

Coordinates ....77,277 N.....
....14,345 E.....

DRILLHOLE No. 78-866
Sheet 2 of 6

Rig .....LONGYEAR 44 WIRELINE .....

Dip .....90°.....

Location ..SLJDE AREA (ALEECE LAKE)....

Bit .....HQ DIAMOND .....

Azimuth .....

Reference elevation ...DRILL FLOOR ...

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	90								Triconed to 97.99 m.
				91								
				92								HW casing to 99.67 m.
				93								
				94								
				95								
				96								
				97								
				98	970.78							97.99-102.32 sl. weath., mass., med. green, mod. str., SANDY CLAYEY SILTSTONE w. tr. carb. material.
20/6 PM		0	35	HQ							L.C.	
		45	50								L.C.	
21/6 AM				99					0			99.46-99.61 green grey, mod. str. fine silty sandstone.
	4	10	44								L.C.	
				100								

Contractor: .....TONTO.....

Logged by: ..AH/JT..

Date started: .....18 JUNE 78.....

Checked by: ..RE....

Date finished: .....22 JUNE 78.....

Date: ..21 JUNE 78..

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH	Coordinates: 77,277 N / 14,345 E	DRILLHOLE No. 78-866 Sheet 3 of 6
Rig: LONGYEAR 44 WIRELINE	Dip: 90°	Location: SLIDE AREA (ALEECE LAKE)
Bit: HQ DIAMOND	Azimuth:	Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m (10, 20)	R.Q.D. (0, 50)	Core Recovery % (0, 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				100								SANDY CLAYEY SILTSTONE CONT.
		100	100						.8			100.11-101.30 lt. grey, mod. str. fine to c. silty sandstone w. carb.frags.
	14	92	100	101, 102				65	.7			101.30-101.84 grey green, mod. str., sandy siltstone. 101.42-101.63 Sample #1, Triaxial 101.84-101.97 grey green, mod. str. siltstone. Detrital coal on bedding plane. 101.47-102.32 grey, mod. weak c. silty sandstone.
				102.32	966.46							102.32-115.80 grey and green and brown disturbed interbedded CLAYEY SILTSTONE AND SANDSTONE w. thin coals, generally sheared and brecc.
	14	76	98	103			MC 28.0		0			102.79-103.33 grey green, clayey silty sandstone. Sheared. 103.33-104.40 light grey, mod. weak, tuff., silty claystone sheared. 103.34-103.64 Sample #2, Limits. 103.64-103.67 Sample #3, M.C.
	20	60	100	104					0			104.40-105.18 grey green, mod. weak, c. tuff., silty sandstone, occ. clay lam.
	15	92	100	105					.7			105.18-106.24 grey and brown weak extensively brecc. clayey silt-stone. Clay rehealing brecc. occ. coal stringers. 106.24-106.60 grey, weak c. silty sandstone. 106.60-107.33 grey and brown weak brecc. Clayey siltstone w. some coal material.
	28.0	66	95	106, 107					0			
	24.0	100	100	108				86, 76, 69, 83	0			107.33-108.19 light grey, cream and black, weak, disturbed inter-bedded thin coal, c. silty sand-stone, brecc. clayey siltstone & carb. siltstone. Slick sheared planes. 107.90-107.98 Sample #4, Att. L. 108.19-108.67 grey green weak fine to c. silty sandstone. 108.67-109.00 green and brown weak, extensively brecc., clayey siltstone and carb. siltstone w. thin coal. 108.68-108.84 Sample #5, Uniaxial/ M.C. 109.00-109.40 grey green, mod. str., siltstone w. thin coals.
	26.0	96	100	109, 110					0			

Contractor: TONTO	Logged by: I.T.	Remarks:
Date started: 18 JUNE 78	Checked by: RE	**Golder Associates**
Date finished: 22 JUNE 78	Date: 21 JUNE 78	Scale: 1:50 metric

Type of drilling ROTARY CORE MUD FLUSH

Coordinates 77,277 N, 14,345 E

Rig LONGYEAR 44 WIRELINE

Dip 90°

Bit HQ DIAMOND

Azimuth

DRILLHOLE No. 78-866

Sheet 4 of 6

Location SLIDE AREA (ALEECE LAKE)

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed/Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	110								CLAYEY SILTSTONE, SANDSTONE CONT.
								80				109.48-110.19 grey, mod. weak, med. to c. silty sandstone w. thin sheared clay and coal inter beds. Distributed bedding.
	2 1 0	100	100	111				86	1.3			110.19-112.22 grey and brown weak, sheared carb. siltstone and clayey siltstone. Coarsely brecc. siltstone rehealed w. grey clay. 110.99-111.16 silty sandstone. 111.80-111.82 ash band.
	2 1 0	100	100	112					.7			112.22-112.44 green weak, c. sandstone. 112.44-112.79 brown weak sheared and brecc. clayey siltstone. 112.79-113.23 black and cream mod. str. interbedded coaly sand stone and clayey tuff. siltstone 113.23-113.43 black, brown and creamy sheared, weak to v. weak coaly, sandy siltstone and tuff. siltstone.
2176 PM		88	100	113					1.3			113.47-114.79 mod. weath., sl. sheared, lt. tan to med. brown, weak sandy siltstone w. some sheared carb. siltstone horizons and some weak sheared green silt stone interbedding. 114.35-114.37 Sample #6, M.C. 114.37-114.57 Sample #7, Uniaxial 114.37-114.57 some small gravel clasts of siltstone in the sandy siltstone.
		100	100	114			MC 29.0	74				114.79-115.84 sl. weath., thick-ly bedded, sheared and brecc. mod. brown, weak to mod. weak carb. clayey siltstone w. some med. green sandy siltstone and siltstone and some lt. brown tuff. siltstone interbeds.
				115					.7			
				115.84	952.94							115.84-121.32 sl. weath., mass., med. green, weak to mod. weak, SILTY CLAY-STONE, SANDY CLAYEY SILTSTONE and CLAYEY SILTSTONE, some shearing and brecc.
		98	100	116					2.0			115.84-117.53 weak, brecc. and sheared silty claystone. 116.02-116.03 med. brown, carb. siltstone. 116.03-116.16 conglomeratic sandstone.
				117			MC 35.3					117.90-117.98 some sandstone lenses. 117.02-117.04 Sample #8, M.C. 117.04-117.23 Sample #9, Uniaxial 117.32-117.53 brecc., mod. weak sandy siltstone.
		76	100	118				60	2.7			117.53-118.87 weak to mod. weak sandy clayey siltstone w. some shearing and brecc. 117.53-117.81 fine congl. w. a silty sandstone matrix.
				119								118.87-121.32 brecc. to mass., weak to mod. weak clayey silt-stone. 118.87-118.97 Sample #10, Att.L. 118.97-118.99 Sample #11, M.C. 119.62-120.29 clayey siltstone is lt. to dk. brown due to carb. content; brecc. and shearing throughout.
		78	100				MC 14.9		2.7			
				120								

Contractor: TONTO

Logged by: IT/AH

Date started: 18 JUNE 78

Checked by: RE

Date finished: 22 JUNE 78

Date: 21 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 77,277 N, 14,345 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SLIDE AREA (ALEECE LAKE)

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-866
Sheet 5 of 6

Depth m	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
120	10 20	0 50	0 50								CLAYEY SILTSTONE, SANDY SILTSTONE AND SILTY CLAYSTONE CONT.
							56				120.42-120.52 v. weak, sheared and brecc., clayey siltstone.
		67	97				66				120.57-120.97 v. sheared and brecc., med. brown to green, v. weak, clayey siltstone.
121				947.46				1.3			120.97-121.32 dk. green, v. sheared and brecc., v. weak, silty claystone w. tr. sand; becoming *conglomeratic*.
121.32						MC 37.1					121.17-121.21 Sample #12, M.C.
122		100	100					0			121.32-138.20 E.O.H. sl. weath., mass. med. greyish green, str. to v. str., c., CONGLOMERATE; *subrounded to rounded*, volc. gravels in a silty fine to c. sandstone matrix; some poorly cemented zones and many breaks along *clast/matrix boundaries; generally* clast supported; some zones w. a dk. dull green, siliceous cement/matrix. Cement weakly calc.
123											122.80- *the conglomerate is* less broken and v. str. from here on down.
124		93	100					0			
125											
126		94	100					0			
127											
128		100	100					0			
							78				128.37-128.55 v. str., greyish green, bedded, silty med. sandstone.
129		98	100					0			128.86-129.50 calc. cementing.
											129.76-130.73 grey green mass., v. str. silty med. sandstone.
130	22/6 AM										

Contractor: TONTO

Logged by: AH/IT

Date started: 18 JUNE 78

Checked by: RE

Date finished: 22 JUNE 78

Date: 22 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 77,277 N, 14,345 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:

DRILLHOLE No. 77-866

Sheet 6 of 6

Location: SLIDE AREA (FLEECE LAKE)
Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	130								CONGLOMERATE CONT.
		92	100						0			130.45-131.18 grey green, v. str. silty med. sandstone.
		36	100	131					0			131.07-138.20 mod. weak to mod. str. congl. breaks readily along clast boundaries. Rubbly recovery.
		48	96	132					0			132.56-133.06 grey green, v. str. silty med. sandstone.
		6	38	133					0		L.C.	134.11-135.64 spring in core barrel system; core lost and ground up.
		68	100	134					0			136.20-136.82 grey green, mod. str., med. to c. silty sandstone occ. fine gravel.
		56	100	135								
				136								
				137								
				138	930.58							
				138.20								138.20 END OF HOLE.
22/6 PM				139								
				140								

Contractor: TONTO
Logged by: LT
Date started: 18 JUNE 78
Checked by: RE
Date finished: 22 JUNE 78
Date: 22 JUNE 78

Remarks: Hole surveyed at 138 m 85°/058°

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 76,993 N, 23,266 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Bit: HW TRICONE

Azimuth:

DRILLHOLE No. 78-867

Sheet 1 of 17.

Location: SOUTHEAST PIT SLOPE

Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m (10, 20)	R.Q.D. (0, 50)	Core Recovery % (0, 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Foi.	Fracture Index	Instrumentation	Legend	Description
				0	932.08							
				0.40	931.68							0.40-30.48 m Triconed (see log of P76-7).
				1								
				2								
				3								
				4								
				5								
				6								
				7								
				8								
				9								
				10								

Contractor: TONTO

Logged by: RE

Date started: 19 JUNE 78

Checked by: RE

Date finished: 24 JUNE 78

Date: 19 JUNE 78

Remarks: HW casing installed to 30.48 m. (Final depth)

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD/POLYMER FLUSH

Coordinates: 76,993 N, 23,266 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SOUTHEAST PIT SLOPE

Bit: HW TRICONE & HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-867

Sheet 2 of 17

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	30								
					901.60							Triconed to 30.48.
20/8 AM	20		100	30.48								30.48-41.45 dense, dk. brownish-green, silty fine SAND interbedded w. stiff to v. stiff, f. sandy SILT. Some thin carb. stringers and coal particles, some thin clayey silt lam., occ. fine to med. gravel, tr. clay.
	16		100	31								30.90-31.30 loose, dk. brownish-green, uniform, fine to med. sand some fine gravel.
				32								
	18		60									32.55-32.73 stiff to v. stiff, greenish-brown, fine sandy silt.
				33			MC 22.2					33.10-33.22 stiff, dk. grey, fine sandy silt. 33.10-33.16 Sample #1, M.C.
											L.C.	
	15		100	34								34.33-35.36 stiff to v. stiff, dk. greenish-grey, uniform silt some fine sand.
				35								35.60-35.83 Sample #2, Triaxial.
	14		100	36								36.00-36.88 dense dk. grey, mass., uniform silty fine sand w. occ. silt seams.
												36.88-38.40 some thin clayey silt lam.
	11		100	37								
				38								38.40-41.45 stiff to v. stiff, uniform fine sandy silt. Some clay; increasing clay content with depth.
	18		100	39			MC 25.0					39.85-39.93 Sample #3, M.C.
				40								

Contractor: TONTO

Logged by: RE

Date started: 19 JUNE 78

Checked by: RE

Date finished: 24 JUNE 78

Date: 20 JUNE 78

Remarks: At 30.48 changed to Polymer Flush.

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH | Coordinates 76,993 N, 23,266 E | **DRILLHOLE No. 78-867** Sheet 3 of 17.

Rig LONGYEAR 44 WIRELINE | Dip 90° | Location SOUTHEAST PIT SLOPE

Bit HQ DIAMOND | Azimuth | Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	40								SAND & SILT CONT.
	11.0		100	41			UCS 650 (94.3)					40.88-41.15 Sample #4, Uniaxial.
				41.45	890.63							41.45-48.45 stiff to v. stiff, uniform clayey SILT. Finely lam. (varved?)
	10.0		94	42								
				43								
	11.0		100	44								
							MC 26.9					44.53-44.73 Sample #6, Triaxial. 44.73-44.78 Sample #5, M.C.
	11.0		100	45								
				46								
	13.0		100	47								
	9.0		94	48								47.55-48.25 stiff to v. stiff, clayey silt w. occ. fine to med. gravel. 48.25-48.45 dk. yellowish-brown silt (prob. bentonitic) grading to a silty, fine sand.
				48.45	883.63							48.45-60.42 loose, dk. brownish-green to dk. green, fine to c. SAND and GRAVEL w. some cobbles.
				49								
	20.0		93	50								49.07-49.27 loose, clean, med. sand grading to c. sand and fine gravel. 49.27-49.77 v. stiff clayey silt w. some fine to med. gravel.

Contractor: TONTO | Logged by: RE | Remarks:

Date started: 19 JUNE 78 | Checked by: RE

Date finished: 24 JUNE 78 | Date: 20 JUNE 78

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,993 N, 23,266 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SOUTHEAST PIT SLOPE
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-867

Sheet 4 of 17

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	50								SAND AND GRAVEL CONT.
	23.0		100									49.47-50.20 loose fine to med. sand and fine to med. gravels. 50.29-50.60 med. to c. gravels w. a loose c. sand matrix. 50.60-50.90 washed gravels.
	22.0		50	51							L.C.	
20/6 PM	20.0		100									51.20-52.34 loose med. to c. sand and fine to med. gravels. 51.50-51.66 stiff, lt. brown, silty clay.
	20.0		100	52								
	23.0		50	53							L.C.	52.34-54.90 subrounded to sub-angular gravels and cobbles in a dense to loose, fine to c. sand matrix, v. little matrix recovered.
	24.0		70								L.C.	
	21.0		50	54							L.C.	
	21.0		100	55								54.90-58.22 fine to med. gravels, and cobbles in a dense c. sand matrix.
	29.0		88	56							L.C.	
	24.0		57	57							L.C.	57.42-57.63 brown, loose, c. gravelly sand.
	32.0		50	58							L.C.	
	34.0		95									58.22-58.80 fine to med. gravels and occ. cobbles, tr. silty sand matrix. 58.80-58.93 gravels in a siltstone matrix. 58.93-59.05 stiff, dk. grey, fine sandy silt. 58.95-58.98 Sample #7, M.C. 59.05-60.42 dk. grey, stiff to v. stiff, fine to med. gravels in a sandy silt matrix.
	28.0		73	59			MC 20.9					
				60								

Contractor: TONTO
Logged by: RE/MR
Date started: 19 JUNE 78
Checked by: RE
Date finished: 24 JUNE 78
Date: 20 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,993 N, 23,266 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SOUTHEAST PIT SLOPE
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-867

Sheet 5 of 17

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	60								SAND & GRAVEL CONT.
				60.42	871.66							60.42-180.14 E.O.H. fresh, dk. olive green, v. weak to weak, brecc. and sl. to mod. sheared, v. fine grain, clayey SILTSTONE w. numerous lt. grey to lt. brownish-yellow. Ash and tuff. bands. Bedding breaks v. common; dip of bedding consistent 70-80° to C.A.
	27|0	0	100	61					0			
							MC 23.4					60.71-60.77 Sample #8, M.C.
												60.77-60.90 Sample #9, Att. Limit
												60.90-61.26 Sample #10, Triaxial.
												61.65-61.85 Sample #10A.
	30|0	60	100	62			MC 31.3		2.6			60.78-60.83 Sample #11, M.C.
				63								
	33|0	100	100						0			
				64								
21/6 AM												64.56-64.57) stiff to v. weak lt.
												65.50-65.51) grey, silty bentonitic claystone . Ash bands.
	39|0	100	100	65			UCS 430 (62.5)	70 40 75	0			
												65.83-66.06 Sample #12, Uniaxial.
				66								
	59|0	76	100					65	1.3			66.51- thin (0.001 m) yellowish-brown, stiff bentonitic claystone lam. - Ash
				67								
												67.36-68.88 siltstone is mass. to sl. brecc.
	72|0	78	100	68					0.7			
				69								
	59|0	83	94						1.3			69.53-69.80 Sample #13, Triaxial.
				70								

Contractor: TONTO
Logged by: MR/RE
Date started: 19 JUNE 78
Checked by: RE
Date finished: 24 JUNE 78
Date: 21 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH | Coordinates 76,993 N, 23,266 E | **DRILLHOLE No. 78-867** Sheet 6 of 17

Rig LONGYEAR 44 WIRELINE | Dip 90° | Location SOUTHEAST PIT SLOPE

Bit HQ DIAMOND | Azimuth | Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	70								CLAYEY SILTSTONE CONT.
							MC 32.0					70.20-70.27 Sample #14, M.C.
	23.0	70	100	71				75 to 80	2.6			71.55-71.80 v. weak, uniform, lt. grey, bentonitic, silty claystone - Ash Band. 71.80-71.93 v. weak to weak, med. gray bentonitic silty claystone grading to a yellowish-brown silty clayey, tuff. fine sandstone. 71.64-71.73 Sample #15, X-Ray. 71.93-73.43 weak to mod. str., mass., clayey siltstone.
	19.0	100	100	72					0			
				73								73.46-76.30 highly brecc. siltstone, weak along bedding. 73.56-73.64 volc. cobble.
21/6 PM	25.0	70	100	74					.7			
				75				75				75.09-76.09 lt. grey bentonitic claystone.
	26.0	70	100	76				75	2.0			76.30-79.80 dk. green, mass., brecc., mod. weak, fract., clayey siltstone. 76.50-79.55 slickensided joint at 50° to C.A. 76.75-76.76 lt. grey bentonitic claystone.
	22.0	60	100	77					5.3			
				78								
	21.0	60	100	79					5.3			
							MC 38.7					79.48-79.55 Sample #16, M.C.
				80								

Contractor: TONTO | Logged by: RE/MR

Date started: 19 JUNE 78 | Checked by: RE

Date finished: 24 JUNE 78 | Date: 21 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH

Coordinates 76,993 N
23,266 E

DRILLHOLE No. 78-867
Sheet 7 of 17

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location SOUTHEAST PIT SLOPE

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				80								CLAYEY SILTSTONE CONT.
	20.0	80	100				MC 41.8	75 to 80	4.6			80.38-80.41 lt. grey bentonitic clay. 80.43-80.48 Sample #17, M.C. 80.48-80.61 Sample #18, Att. Lim. 80.61-80.84 Sample #19, Uniaxial.
	26.0	50	100	81			UCS 427 (62)	75	.7			
	28.0	100	100	82				75 to 80	.7			82.60-85.65 dk. grey, mass., to bedded, mod. weak, unfractured clayey siltstone, some drilling induced breaks along bedding. 83.76-83.77 bentonitic claystone.
	22.0	74	100	83					0			84.12-84.38 weaker siltstone zone
22/6 AM	23.0	60	100	84					0			85.65- fract. siltstone w. long sub-vertical joints. 85.71-85.72) bentonitic claystone 85.79-85.80) bands.
	18.0	52	98	85					0			88.37-88.41 lt. brownish-grey, mod. weak, uniform, clayey siltstone (poss. tuff.) 88.90-88.91 thin brownish-grey, mod. weak tuff. clayey siltstone.
	12.0	72	100	86				75	2.0			
				87								
				88								
				89								
				90								

Contractor: TONTO

Logged by: MR/RE

Date started: 19 JUNE 78

Checked by: RE

Date finished: 24 JUNE 78

Date: 22 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH

Coordinates 76,993 N
23,266 E

DRILLHOLE No. 78-867
Sheet 8 of 17

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location SOUTHEAST PIT SLOPE

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

Depth m	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
											CLAYEY SILTSTONE CONT.
90											90.53-90.57 v. weak, lt. brownish yellow, uniform, bentonitic, silty claystone. 90.57-90.63 v. weak to weak, med. grey, tuff., silty claystone.
91	12.0	70	100			MC 28.2	75 to 80	.7			91.00-91.01 lt. to med. grey, tuff., v. weak clayey siltstone. 91.00-91.30 Sample #20, Triaxial. 91.42-91.47 Sample #21, M.C.
92	13.0	60	100					0			
93											93.92-93.97 lt. cream, v. weak, bentonitic silty claystone w. dk. olive grey siltstone clasts.
94	13.0	90	100					0			94.24-94.25 v. weak, lt. grey, uniform, bent. silty claystone - Ash.
95											
96	13.0	75	100					0			
97	12.0	100	100					0			97.20-97.30 v. weak, to weak brownish grey tuff, clayey siltstone - Ash.
98	13.0	80	100			UCS 4314 (626) MC 25.3		0			98.20-98.48 Sample #22, Uniaxial. 98.42-98.54 Sample #23, M.C.
99											99.36-100.89 many rotated drill breaks.
100											

Contractor: TONTO
Logged by: RE
Date started: 19 JUNE 78
Checked by: RE
Date finished: 24 JUNE 78
Date: 22 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH

Coordinates 76,993 N, 23,266 E

DRILLHOLE No. 78-867
Sheet 9 of 12

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location SOUTHEAST PIT SLOPE

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m (10 / 20)	R.Q.D. (0 / 50)	Core Recovery % (0 / 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				100								CLAYEY SILTSTONE CONT.
	20 | 0	20	100						0			
	20 | 0	60	100	101					.7			
				102								102.25-102.30) cream, mod. weak 103.50-103.57) ash band.
	8 | 0	15	95	103					.7			
												103.59-103.61 pale grey soft, clayey siltstone.
	20 | 0	45	100	104					1.3			
				105								
	10 | 0	30	100	106					2.7			
				107								107.20-109.20 dk. grey, str. to v. str., clayey siltstone. 107.45-107.65 Sample #24, Uniaxial
	18 | 0	76	100				UCS 5388 (782)		1.3			
				108								
	16 | 0	68	100	109					1.3			109.20-110.03 numerous rotated clay filled drilling breaks.
				110								

Contractor: TONTO

Logged by: RE/IT

Date started: 19 JUNE 78

Checked by: RE

Date finished: 24 JUNE 78

Date: 22 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,993 N, 23,266 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:

DRILLHOLE No. 78-867
Sheet 10 of 17

Location: SOUTHEAST PIT SLOPE
Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	110								CLAYEY SILTSTONE CONT.
	18.0	54	72	111					0			110.92-110.95 dk. grey soft clay.
							UCS 3735 (542)				L.C.	
22/6 PM							MC 26.7					111.70-111.95 Sample #25, Uniaxial 111.95-112.03 Sample #26, M.C.
	18.0	67	100	112				75	0			
				113								
	24.0	56	100	114					.7			114.08-114.09 tuff. clayey siltstone band. 114.26-114.29 weak bentonitic, silty claystone band - Ash. 114.60-119.18 dk. green, mass., mod. str. clayey siltstone w. some shearing and occ., tuff., siltstone bands. 115.07-115.08 bentonitic silty claystone. 115.25-115.50 mod. str., tuff. siltstone.
	30.0	90	100	115					1.3			
				116								
	28.0	80	100	117					1.3			116.50-116.64 stiff, bentonitic, silty clay w. lt. brown tuff. siltstone clasts. 117.43-117.44 bentonitic, silty claystone. 117.95-118.31 mod. weath., brecc. weak clayey siltstone.
				118				77				
	23.0	80	100	119				75	2.0			
	29	15	100	120					0			119.18-120.70 entire run w. clay filled rotated breaks.

Contractor: TONTO
Logged by: IT/MR
Date started: 19 JUNE 78
Checked by: RE
Date finished: 24 JUNE 78
Date: 22 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,993 N, 23,266 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SOUTHEAST PIT SLOPE
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-867

Sheet 11 of 17.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	120								CLAYEY SILTSTONE CONT.
							MC 19.1					120.70- sl. weath., some bedding, mod. weak to mod. str. clayey siltstone.
							UCS 4617 (670)					120.73-120.77 Sample #27, M.C.
												120.77-121.06 Sample #28,Triaxial
				121								121.06-121.19 Sample #29,Uniaxial
	23.0	70	100						1.3			
				122				80				122.22-123.75 some bedding breaks
	25.0	70	91					77				
				123					1.7			
												123.75-125.27 some clay filled rotated breaks, carb. tr. along bedding.
				124								
	20.0	62	100						0			
				125								
23/6 AM												125.67-125.73 pale grey, mod. str., tuff. horizon; gradational contacts.
	20.0	66	100	126					2.6			
		0	100	127					2.0			127.00-127.02) cream to tan,
												127.10-127.11) med. grain, tuff.
												127.20-127.21) siltstone bands silicified
	27.0	58	96						1.3			127.78-127.90 cream to tan soft clayey bentonitic siltstone.
				128								127.78-127.90 Sample #30,Limits.
	23.0	74	100	129					1.7			129.00-129.11 dk. grey, v. weak brecc., clayey siltstone. Rubbly fabric.
												129.79-129.85 brecc. and weakly sheared, clayey siltstone.
				130								

Contractor: TONTO
Logged by: MR/IT
Date started: 19 JUNE 78
Checked by: RE
Date finished: 24 JUNE 78
Date: 23 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling .... ROTARY CORE POLYMER FLUSH ..

Coordinates .....76,993 N.....
.....23,266 E.....

DRILLHOLE No. 78-867
Sheet 12 of 17.

Rig .....LONGYEAR 44 WIRELINE.....

Dip .....90°.....

Location ...SOUTHEAST PIT SLOPE.....

Bit .....HQ DIAMOND.....

Azimuth .....

Reference elevation ...DRILL FLOOR....

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
												CLAYEY SILTSTONE CONT.
	23.0	38	98	130					2.3			130.33-130.52 Some 1 cm. thick ash bands.
	21.0	46	96	131					1.7			131.58-131.61 cream to tan, mod. str., tuff. clayey siltstone.
				132			UCS 3893 (565)					132.08-132.14 cream to tan, mod. str., tuff., clayey siltstone.
	20.0	58	96	133					2.3			132.94-133.07 Sample #31 Uniaxial
				134								133.60-133.88 1 cm thick ash band
	20.0	40	100	135			MC 26.2		2.3			134.60-134.64 cream to tan, mod. str., tuff. siltstone, slickenslide surfaces.
	22.0	84	100	136					2.7			135.87-135.94 Sample #32, M.C.
	21.0	66	100	137					3.1			136.47-136.53 Some 1 cm. thick ash bands.
	23.0	78	100	138					1.3			137.25-139.32 dk. brown, v. weak brecc., clayey siltstone.
				139								
				140								

Contractor: .....TONTO.....
Logged by: ...IT....

Date started: .....19 JUNE 78.....
Checked by: ..RE....

Date finished: ....24 JUNE 78.....
Date: 23 JUNE 78...

Remarks:

Golder Associates

Scale: 1:50
metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,993 N. 23,266 E.
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SOUTHEAST PIT SLOPE
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-867
Sheet 13 of 17

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	140								CLAYEY SILTSTONE CONT.
												140.00-140.32 Sample #33, Triaxial
												140.35-140.51 cream to tan, str. fine tuff., clayey siltstone.
												140.51-142.04 dk. grey, v. weak sheared and brecc. clayey siltstone.
23/6 PM				141								
	20.0	40	100				MC 28.4		1.3			
												141.94-141.98 Sample #34, M.C.
				142				83				
												142.20-142.40 cream, mod. str., tuff., clayey siltstone.
	42.0	40	80						1.3			
				143								
							MC 19.8				L.C.	
												143.62-143.68 Sample #35, M.C.
	23.0	26	98	144					.7			
				145			MC 23.3	80				145.18-145.24 Sample #36, M.C.
												145.91-146.28 sheared and brecc. siltstone.
	25.0	36	100						2.6			
				146								146.00-146.10 cream, mod. str., tuff., clayey siltstone.
							MC 21.3					
												146.90-146.96 Sample #37, M.C.
												146.96-147.15 Sample #38, Uniaxial
							UCS 4619 (670.4)					147.18-147.19 ash band.
				147								147.40-148.13 dk. grey, v. weak, brecc., clayey siltstone.
	20.0	27	95					82	1.3			
				148								148.13-152.31 med. to dk. grey, mod. weak to mod. str., clayey siltstone, some shearing and some ash lam.
								80 to 70				
	18.0	64	100	149					2.6			
												149.41-149.48 lt. grey, mod. str. tuff. siltstone.
												149.83-149.84 ash band.
				150								

Contractor: TONTO
Logged by: IT/MR
Date started: 19 JUNE 78
Checked by: RE
Date finished: 24 JUNE 78
Date: 23 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH | Coordinates 76,993 N, 23,266 E | **DRILLHOLE No. 78-867** Sheet 14 of 17.

Rig LONGYEAR 44 WIRELINE | Dip 90° | Location SOUTHEAST PIT SLOPE

Bit HQ DIAMOND | Azimuth | Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	150								CLAYEY SILTSTONE CONT.
	12.0	72	100	151					3.9			150.98- ash band 0.005 m thick. 151.16-151.23 lt. grey, mod. str. tuff. clayey siltstone.
	11.0	70	100	152				77	2.6			152.31-154.40 med. grey, weak, brecc., clayey siltstone. 152.35-152.38) lt. brown, soft, 152.60-152.64) bentonitic clay. 152.38-152.48 v. weak, brecc., silty claystone.
	13.0	58	100	153					0			
				154			UCS 3953 (573.6)					
	19.0	70	100	155			MC 27.6	75 to 80	0			154.40-156.96 dk. grey, weak bedded siltstone. 154.98-155.15 Sample #39, Uniaxial 155.15-155.21 Sample #40, M.C.
24/6 AM				156								
	18	68	100	157					.7			156.96-159.66 dk. grey, weak to v. weak, clayey siltstone. Core broken into 2-4 cm discs.
	21	32	86	158					.7			158.60-158.80 lt. grey to brown, v. str. siltstone. 158.90-158.92 lt. grey tuff., sandstone interbed.
	20	12	98	159				80	.7		L.C.	159.66-160.28 dk. grey, v. weak and brecc., clayey siltstone. Core swells and breaks down upon removal from tube.
				160								

Contractor: TONTO | Logged by: MR/MM | Remarks:

Date started: 19 JUNE 78 | Checked by: RE

Date finished: 24 JUNE 78 | Date: 24 JUNE 78

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 76,993 N, 23,266E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: SOUTHEAST PIT SLOPE
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-867

Sheet 15 of 17.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	160								CLAYEY SILTSTONE CONT.
	34	64	100	161				82	0			160.28-160.35 cream, weak tuff. horizon. 160.50-160.64 cream, mod. str., tuff. horizon, lower contact distinct at 82° to C.A.; shows graded bedding to fine sandstone at base. 160.64-161.37 str., dk. grey mass clayey siltstone. 161.35-161.41 Sample #41, Att. L. 161.37-162.34 v. weak and brecc. clayey siltstone. 161.85-162.03) cream tuff., silt- 162.09-162.12) stone. 162.34-166.46 dk. grey, mod. str. clayey siltstone, weaker along bedding; mass., rapid fract. development w. exposure to air at 77° to C.A. (probable bedding).
	35	70	100	162					0			
				163								163.97-164.22 Sample #42, Triaxial
	34	100	100	164					0			
				165				75 74				164.83-164.92 lt. grey, mod. str. tuff. siltstone w. small scale "flame" structures showing "right way up". Lower contact w. grey siltstone sharply defined at 74° to C.A.
	24	60	100	166			MC 25.0 UCS 4265 (619)		.7			166.06-166.12 Sample #43, M.C. 166.12-166.34 Sample #44, Uniaxial 166.35-166.42 siltstone breaks w. conchoidal fract. 166.42-171.45 dk. grey, mod. str. to str., clayey siltstone.
	32	84	100	167					.7			167.84-167.91 cream, v. str., tuff. horizon; non-calcitic.
				168				73				
	29	43	83	169				78	.7		L.C.	169.47-170.99 siltstone weak along bedding.
24/6 PM				170								

Contractor: TONTO
Logged by: MH/MR
Date started: 19 JUNE 78
Checked by: RE
Date finished: 24 JUNE 78
Date: 24 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH | Coordinates 76,993 N, 23,266 E | **DRILLHOLE No. 78-867** Sheet 16 of 17

Rig LONGYEAR 44 WIRELINE | Dip 90° | Location SOUTHEAST PIT SLOPE

Bit HQ DIAMOND | Azimuth | Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				170								CLAYEY SILTSTONE CONT.
	13	82	100					78	3.3			170.59-170.64 mod. weak, cream, tuff., clayey siltstone.
	19	90	100	171					.7			171.71-171.79 med. grey, mod. str tuff. siltstone. 171.95-172.04 cream, mod. weak, tuff., siltstone. 171.95-172.55 dk. grey, weak, brecc., clayey siltstone. 172.52-174.23 mod. weak to mod. str., siltstone, weak along bedding.
	23	94	100	172				78	0			
	30	82	100	173				82	0			174.25-174.36 lt. grey, weak, tuff., silty claystone. 174.55-174.65 cream, mod. str., tuff., clayey siltstone.
	14	100	100	174					0			175.45-175.88 lt. grey, mod. str. tuff., clayey siltstone. 175.64-175.74 Sample #45, Att. L. 175.88-176.28 v. weak, brecc., siltstone.
	18	46	100	175					0			176.28-176.37 cream, mod. str., tuff., siltstone. 176.37-176.49 weak, brecc., clayey siltstone.
	21	66	100	176					.7			178.49-178.67 lt. grey, mod. str. tuff., silty claystone. 178.67-180.14 dk. grey, mass., to bedded clayey siltstone.
				177								
				178								
				179					2.0			179.33-179.43 tuff. clayey siltstone.
				180				68				

Contractor: TONTO | Logged by: MR

Date started: 19 JUNE 78 | Checked by: RE

Date finished: 24 JUNE 78 | Date: 24 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH

Coordinates: 76,993 N, 23,266 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: SOUTHEAST PIT SLOPE

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-867

Sheet 17 of 17

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	180								CLAYEY SILTSTONE CONT.
				180.14	751.94							180.14 END OF HOLE.

Contractor: TONTO

Logged by: MR

Date started: 19 JUNE 78

Checked by: RE

Date finished: 24 JUNE 78

Date: 24 JUNE 78

Remarks: Hole surveyed at 180 m. 88°/353°

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HW TRICONE & HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 1 of 20.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	0	1088.44							
23/6 PM				0.30	1088.14							0.30-2.44 Triconed through slide debris.
				1								
				2								
				2.44	1086.00							2.44-11.41 sl. weath. to extremely weath., volc. boulders in a matrix of weath., brown stiff reworked clayey siltstone to v. weak silty sandstone - SLIDE DEBRIS.
	1 4.0		26	3							L.C.	
	3.0		4	4							L.C.	
	4.0		31	5							L.C.	
	5.0		31	6							L.C.	
	2.0		42	7							L.C.	
	4.0		49	8							L.C.	
	10.0		100	9								
	18.0		100	10								

Contractor: TONTO
Logged by: JG
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 23 JUNE 78

Remarks: Final HW casing depth 65.53 m.
Final N casing depth 162.76 m.

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 2 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	10								SLIDE DEBRIS CONT.
	8.0	24	68	11							L.C.	
				11.41	1077.03			61				11.41-32.61 extremely weath., dk. grey green, v. stiff, GRANODIORITE and SILTSTONE COLLUVIUM w. granodiorite and sandstone boulders in a matrix of clayey siltstone and sandstone.
	4.0	12	24	12							L.C.	
	4.0	12	69	13								13.30-14.78 v. weath., almost cohensionless granodiorite boulder.
				14							L.C.	
	4.0	38	45	15							L.C.	
	7.0	88	94	16								16.14-16.41 granodiorite boulder.
												16.90-18.90 predominately granodioritic sandstone colluvium w. some siltstone lenses; some shearing in the siltstone.
	7.0	24	45	17							L.C.	
	9.0	87	100	18								
				HW TRICONE								
24/6 AM				19								19.51-19.78 v. soft brownish-orange sand and silt, w. some fine gravel; probably slough left after casing. 19.78-19.90 v. weak and friable, brownish-orange highly weath., congl. w. a sandstone matrix and fine to med. gravel clasts. 19.90-19.97 friable granodiorite colluvium covered w. a lt. grey silty clay.
				HQ								
				20								

Contractor: TONTO
Logged by: JG
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 24 JUNE 78

Remarks: HW casing to 19.51 m

Golder Associates

Scale: 1:50 metric

Type of drilling ...ROTARY, CORE, POLYMER, FLUSH....

Coordinates .....79,168 N.....
.....12,542 E.....

Rig ..... LONGYEAR 38 TRUCK MOUNT.....

Dip .....90°.....

Location ....SLIDE AREA.....

Bit .....HQ DIAMOND.....

Azimuth .....

Reference elevation ....DRILL FLOOR...

DRILLHOLE No. 78-868

Sheet 3... of 20..

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	20								GRANODIORITE & SILTSTONE COLLUVIUM CONT.
	3	0	62								L.C.	20.73- some shearing along a clay infilled joint. 20.73-23.90 v. weak, lt. brownish grey, silty granodioritic sandstone w. some sheared dk. brownish-grey, clayey siltstone interbedding, and some small carb. horizons within the sandstone. 20.87-21.09 Sample #1, Uniaxial. 21.09-21.12 Sample #2, M.C.
	7.0	30	70	21			UCS 361 (52.4)		.8			
							MC 21.6				L.C.	
	7.0	94	94	22					1.3			
				23				45				
	4.0	94	94	24					.7			23.90-23.98 lt. brown, v. weak, silty fine sandstone. 23.98-24.13 lt. bluish-grey, str. clayey siltstone. 24.13-25.97 mod. weath., bedded lt. brownish-grey, v. weak, silty fine granodioritic sandstone w. some interbeds of dk. to med. brown, sandy siltstone and some micaceous lam.; some disturbed areas. 24.67-24.69 Sample #3, M.C. 24.69-24.90 Sample #4, Triaxial. 25.38-25.41 granodiorite gravel.
	4.0	94	100	25			MC 18.5	42				
				26					1.3			
	5.0	83	100	27				61				25.97-27.15 mod. weath., mass., w. occ. micaceous lam., mod. str. c. granodioritic sandstone. 27.15-27.24 silty, med. brown, fine to c. sandstone.
								56	4.7			27.24-27.61 med. brown, mass., disturbed, sandy siltstone w. tr. pyrite.
				28				65				27.61-27.97 med. brown, bedded to mass., silty fine sandstone. 27.97-28.04 pale brown, lam., sandy siltstone.
	5.0	88	100				MC 25.4					28.04-28.53 sl. weath., sheared and brecc., lt. blue-green and brownish-olive, weak silty clyst. 28.04-28.10 Sample #7, M.C. 28.42-28.44 carb. horizon.
				29				58	3.3			28.53-32.61 mod. weath., disturbed, med. brown to blackish-brown, v. weak, sandy siltstone and silty fine sandstone w. some med. to c. sandstone; all micaceous w. dark blackish brown areas being sl. carb.
				30								

Contractor: .....TONTO.....

Logged by: ...AH.....

Date started: ....23 JUNE 78.....

Checked by: ..RE.....

Date finished: ...28 JUNE 78.....

Date: ..24 JUNE 78..

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 4 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	30								GRANODIORITE & SILTSTONE COLLUVIUM CONT.
	10	22	56	31					2.7		L.C.	
	10	88	88	32			MC 22.7 UCS 406 (59)	58 69	.7		L.C.	31.76-31.78 Sample #10, M.C. 31.78-31.99 Sample #11, Uniaxial.
				32.61	1055.83						L.C.	32.61-34.93 sl. weath., v. brecc., med grey, str., SILTY CLAYSTONE.
	5	0	20	33							L.C.	32.61-33.63 claystone breccia consisting of med. grey silty claystone w. a brownish-grey, stiff, plastic, sometimes sandy, claystone matrix.
	5	17	70	34								33.63-34.93 v. brecc. claystone is v. rubbly.
	7	60	100				MC 11.2				L.C.	34.14-34.16 Sample #12, M.C.
	10	26	100	34.93	1053.51							34.57-34.93 silty claystone is becoming sandy.
				35					3.3			34.93-133.94 slightly to med. weath., mod. weak to str., brown grey-green or pale green, fine to c. GRANODIORITIC SANDSTONE w. interbeds of clayey and carb. siltstone and micaceous sandstone bedding angles generally 55-70° to C.A.; some disturbed zones.
	9	71	82	36				45	1.3			35.37-35.48 med. green, weak sandy siltstone.
				37							L.C.	35.53-35.58 med. green, weak, sandy siltstone.
												36.70-36.72 v. weak, sheared, green, clayey sandstone.
												36.72-37.30 v. weath., mass., purple to green, weak, silty sandstone.
												37.75-37.87 purple tinge to sandstone.
	6.5	100	100	38			MC 8.4 UCS 389 (56.5)		2.0			38.43-38.47 Sample #5, M.C. 38.47-38.71 Sample #6, Uniaxial. 38.7-38.81 v. soft, sheared, c. silty sandstone.
				39				30				
	5.0	91	95						1.3			39.90-40.91 interbedded silty fine sandstone and silty, med. to c. sandstone, many micaceous lam.
				40								

Contractor: TONTO
Logged by: AH
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 24 JUNE 78

Remarks: HW casing to 39.32 m.

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 5 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	40								GRANODIORITIC SANDSTONE cont'd
	7 0	86	100	41			MC 5.4	40 54	4.0			40.91-42.67 lt. green, lam., sl. weath., weak to mod. weak, silty fine sandstone w. some med. to c. sandstone interbedding. 41.24-41.46 Sample #7, Triaxial. 41.46-41.58 Sample #8, M.C. 41.58-41.59 med. green, sandy siltstone.
	8 0	80	98	42				57				
				43				51 57	1.3			42.67-51.68 mod. str., to str., med. to c. sandstone interbedding w. fine silty sandstone; many lam. areas; occ. sheared bedding plane and occ. sheared joint.
24/6 PM	7	94	100	44		0	UCS 479 (69.5)	57	2.0			44.38-44.59 Sample #13, Uniaxial. 44.49-44.66 some slick surfaces. 44.59-44.66 Sample #14, M.C.
	7	93	95	45			MC 11.4	61				
				46				58 60	.7			46.88-46.90 dk. green, weak, micaceous sandy siltstone.
	6 0	89	100	47					1.3			
								63				47.83-47.88 dk. green, sheared, v. weak, silty fine sandstone.
	7	86	89	48				62				48.10- normal movement along a sheared joint @ 58°, to C.A.
				49				61	0			
								65	2.7			49.49-49.68 some shearing in v. weak sandstone.
				50								

Contractor: TONTO
Logged by: AH
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 24 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 6 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	50								GRANODIORITIC SANDSTONE cont'd
	5	60	94					68				50.75-50.85 v. weak, silty fine sandstone. 50.90-51.68 some lt. greenish-blue siltstone interbedded w. silty sandstone; some shearing.
				51				62				
	5	82	82						.7			51.68-54.31 mod. weath., disturbed, brownish-green, mod. weak, silty fine to c. granodioritic sandstone w. some sandy siltstone interbeds; some shearing and contorted bedding planes; some brecc.
				52				20				
							UCS 333.5 (48.4)				L.C.	51.94-52.13 Sample #15, Uniaxial. 52.13-52.17 Sample #16, M.C.
							MC 9.3	50				
	5.0	92	100	53					2.0			
								66				
				54								54.16-58.08 some brown, micaceous lam. and a brown tinge to some of the sandstone.
	5.0	100	100					64	.7			
				55				61				
								65				
	5.0	100	100	56					.7			56.46-56.47 Sample #17, M.C. 56.47-56.72 Sample #18, Triaxial.
							MC 15.9	71				
								70				
				57				68				57.72-57.79 med. grey, brecc., mod. str., siltstone.
	4.0	90	98						1.3			
				58				62				58.08-58.83 contorted lam. in mod. weak, fine silty sandstone. 58.83-59.82 mod. weath., lam., lt. brown, mod. str., siltstone w. some interbedded fine silty sandstone; some v. brecc. zones and some shearing along joints.
								50				
				59								
	5.0	54	98						3.3			59.82-61.57 mod. weath., v. brecc w. some shearing, lt. brown to lt. grey, mod. weak siltstone and silty fine sandstone; micaceous.
								59				
				60								

Contractor: TONTO
Logged by: AH
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 24 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N. / 12,542 E.
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 7 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	60								GRANODIORITIC SANDSTONE cont'd
	7.0	8	92	61								61.04-61.25 v. brecc. w. some shearing, dk. green, silty fine sandstone.
	8.0	30	100	62					3.3			61.57-65.49 mod. weath., bedded, greyish-green, weak to mod. weak silty fine to c. granodioritic sandstone; micaceous lam. 61.57-61.75 siltstone frags. in a sandy matrix.
	6.0	56	100	63				50	4.6			
	4.0	60	100	64				48				
	7.0	82	100	65			MC 6.0	56	0			64.58-64.94 Sample #19, Triaxial. 64.94-65.00 Sample #20, M.C.
	6.0	100	100	66			UCS 794 (115.2)	61	0			65.00-65.25 Sample #21, Uniaxial. 65.49-77.92 mod. weath., mass., speckled grey and white, weak granitic sandstone w. some clayey siltstone interbeds and carb. infilled fracts.
				67					0			
	6.0	45	96	68					1.3			67.44-67.55 carb. infilled fract. 67.66-67.86 granodioritic sandstone. 67.86-67.98 some clayey siltstone interbeds. 68.17-68.74 med. olive green, sandy, clayey siltstone to silty claystone w. carb. material. 68.74-69.08 disturbed clayey c. sandstone w. some siltstone pieces, poorly cemented.
	11.0	58	82	69					0			
				70							L.C.	

Contractor: TONTO
Logged by: AH/MR
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 24 JUNE 78

Remarks: HW CASING TO 65.53 m.

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH

Coordinates 79,168 N
12,542 E

Rig LONGYEAR 38 TRUCK MOUNT

Dip 90°

Bit HQ DIAMOND

Azimuth

DRILLHOLE No. 78-868

Sheet 8 of 20

Location SLIDE AREA

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	70								GRANODIORITIC SANDSTONE CONT.
25/6 AM	20	35	100					40	1.6		L.C.	70.10-70.13 volc. gravel in a sheared, sandy clay matrix. 70.13-70.15 carb. siltstone.
	9	82	100	71				55	2.0			71.36-71.48 v. friable, c. sandstone.
	15	80	80	72				49	1.3			72.15-72.19 med. brown, carb., sandy siltstone w. coaly lam.; sheared along bedding. 72.19-72.24 med. green, brecc. and sheared, fine silty sandstone w. some clay along fract. 72.24-72.63 some shearing along bedding. 72.63-72.68 grey, str., siltstone w. sheared contact to overlying sandstone. 72.68-72.81 med. brown, v. stiff, sandy clay; steep contact w. underlying micaceous sandstone.
	7 0	76	100	73			MC 13.7	49	2.7		L.C.	73.14-73.31 dk. green, sandy siltstone 73.76-74.15 dk. green, sandy siltstone. 73.95-74.01 Sample #22, M.C. 74.99-75.19 med. green, sandy, siltstone and siltstone w. some shear along bedding.
	6 0	79	100	74			MC 13.2	63				75.29-75.56 med.green, weak, sandy siltstone w. some fine sandstone; some brecc. 75.29-75.49 Sample #23, Uniaxial 75.49-75.54 Sample #24, M.C.
	8 0	76	84	75				51				76.08-76.11 med. brown, carb. siltstone horizon. 76.11-76.42 weak, med. green, sandy siltstone w. some shearing. 76.81-77.11 v. weak, silty sandstone. 77.11-77.58 brown, sl. carb., weak, silty sandstone w. two granodiorite cobbles and v. distorted bedding. 77.58-77.92 lam., lt. green to lt. brown, mod. weak siltstone and silty sandstone.
	8 0	86	97	76				47	1.3			77.92-78.42 sl. weath., sheared and brecc., bedded, med. brown to brownish-green, weak to mod. weak clayey siltstone w. some sandy siltstone.
				77				22	.7			
				78				51			L.C.	78.42-78.56 micaceous, fine silty sandstone.
				79				26				78.56-80.57 clayey siltstone, as 77.92-78.42.
	8 0	86	97				MC 21.2 UCS 244 (35.4)		2.0			79.47-79.51 Sample #25, M.C. 79.51-79.80 Sample #26, Uniaxial.
				80								

Contractor: TONTO

Logged by: AH

Date started: 23 JUNE 78

Checked by: RE

Date finished: 28 JUNE 78

Date: 25 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 9 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	0 20	0 50	0 50	80								GRANODIORITIC SANDSTONE CONT.
	5.0	95	95	81				60 41	1.3			80.57-80.89 lt. to med. brown, and blackish-brown, bedded micaceous silty sandstone.
	9.0	56	96	82				56	4.0			81.38-82.59 sl. weath., bedded, fine to c. str. to mod. weak, silty sandstone, micaceous.
	8	18	100	83								82.85-84.59 sl. weath., brecc., dk. grey, mod. weak to mod. str., fine sandstone w. some c. volc. sand.
	7	22	80	84 85				70	2.0		L.C.	84.59-84.70 lt. green, mod. weak siltstone. 84.70-84.91 blackish-brown, v. friable, sl. carb., silty sandstone. 84.91-86.55 sl. weath., bedded pale grey, med. to c. weak to mod str., fine to c. granodioritic sandstone. 85.26-85.28 extremely weak and friable, brown, silty fine sandstone.
	10.0	69	100	86 87				78	1.3			86.29-86.55 silty, fine sandstone and weak, sandy siltstone. 86.55-88.18 sl. weath., bedded, mod. grey, str., c.,micaceous sandstone. Some carb. lam. 86.91-86.92 v. weak, dk. brown siltstone. 87.78-88.18 sandstone is very weak and friable.
	7.0	87	96	88				74 66	0			
	8.0	74	100	89 90				58				

Contractor: TONTO
Logged by: AH
Date started: 23 JUNE 78
Checked by: RF
Date finished: 28 JUNE 78
Date: 25 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH

Coordinates 79,168 N
12,542 E

DRILLHOLE No. 78-868
Sheet 10 of 20

Rig LONGYEAR 38 TRUCK MOUNT

Dip 90°

Location SLIDE AREA

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	90								GRANODIORITIC SANDSTONE cont'd
								49				90.53- bedding hard to discern below this depth; disturbed material or poorly bedded at time of deposition.
	7.0	67	100	91				62	1.3			
				92								92.35-92.60 Sample #27, Uniaxial.
	7.0	88	100	93				56	2.0			
								58				
	6.0	68	80	94					1.3			94.05-94.17 v. brecc. siltstone. 94.17-94.42 str., c. sandstone.
				95							L.C.	
	7.0	58	80						.7			95.48-96.12 dk. blackish-brown to black, weak, sheared, carb., micaceous, silty fine to med. sandstone.
				96							L.C.	96.29-96.32 lt.greenish-brown, soft, clayey silt w. some gravel. 96.62-96.77 v. friable, med. sandstone. 96.77-97.29 v. weak, silty fine to c. sandstone; some friable areas.
	6.0	80	88	97			MC 8.9		1.3			97.77-97.98 Sample #28, Triaxial. 97.98-98.00 Sample #29, M.C. 97.29-98.05 sl.weath., bedded, brecc. and sheared, pale brown to greenish-blue, weak, interbedded claystone, siltstone and fine silty sandstone; some carb. material.
								49 40				
				98							L.C.	
							UCS 297 (43.2)					98.47-98.67 Sample #30, Uniaxial. 98.67-98.69 Sample #31, M.C.
	6.0	81	86	99			MC 15.4		1.3			99.19-99.49 granodioritic sandstone is v. weak and friable; some shearing along bedding.
								61			L.C.	
				100								

Contractor: TONTO
Logged by: AM
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 25 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 11 of 20

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				100								GRANODIORITIC SANDSTONE cont'd
	5.0	73	97	101				55 65	1.3			100.45-100.85 lt. brownish-green, disturbed, sheared, weak, sandy, claystone w. some carb. pockets.
	5.0	96	100	102					1.3			101.19-101.62 med. brownish-green disturbed, sheared and brecc., weak sandy claystone and silty sandstone w. some carb. pockets. 101.64-102.25 v. weak, friable, med. to c. sandstone w. some siltstone and discontinuous carb. lam. 102.25-102.38 med. brown to blue, disturbed, weak siltstone. 102.83- clay infilled sheared fract. 103.22-103.31 mod. weath., reddish-brown, micaceous siltstone interbed; 103.56-103.60 pocket of med.brown clayey silt. 103.84-104.14 pale greenish-brown weak, silty, micaceous fine sandstone w. some shearing. 103.90-103.92 Sample #32, M.C. 104.24-104.33 v. weak, friable, sandstone. 104.24-104.30 Sample #33, M.C. 104.94-105.23 reddish-brown and lt. greenish-brown, sheared and brecc., bedded, weak, sandy, clayey siltstone.
	5.0	100	100	103 104			MC 8.7	47 54	0			
	5.0	68	100	105			MC 12.2	32	2.0			105.41-105.77 brecc. and friable sandstone. 105.77-106.23 str., highly fract. granodioritic sandstone; sheared clay along one fracture. 106.23-106.47 brecc. and friable granodioritic sandstone. 106.47-106.52 v. weak sheared silty granodioritic sandstone.
	7.0	0	55	106 107					0			107.29-111.95 mod. weath., weak c. sandstone and fine to med. granodioritic sandstone w. carb., infilled joints.
25/6 PM	5.0	52	100	108			MC 10.5 UCS 909 (132)		2.0			108.09-108.80 v. weak, fine to med. granodioritic sandstone. 108.81-108.90 Sample #34, M.C. 108.90-109.10 Sample #35, Uniaxial
	7.0	62	82	109 110					.7			

Contractor: TONTO
Logged by: AH
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 25 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH

Coordinates 79,168 N, 12,542 E

DRILLHOLE No. 78-868
Sheet 12 of 20

Rig LONGYEAR 38 TRUCK MOUNT

Dip 90°

Location SLIDE AREA

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	110								GRANODIORITIC SANDSTONE cont'd
											L.C.	110.34-110.42 dk. brown, brecc., sandy siltstone.
	6.0	54	100	111					.7			110.42-111.86 v. weak, micaceous c. sandstone, poorly cemented. 110.85- brown clay in slick joint. 111.03-111.32 med. green, weak, uniform, sandy silty claystone. 111.95-112.26 weak c. sandstone w. distorted lam. and tr. iron staining. 112.26-113.83 lam., weak to mod. weak, c.micaceous sandstone. Some clayey siltstone and silty fine sandstone interbeds; some shearing.
	6.0	100	100	112					2.0			
				113								113.83-113.93 mod. weak, silty, fine sandstone.
	5.0	59	100	114					2.0			114.41-115.20 med. green, mass., mod. weak, silty fine to med. sandstone.
				115								115.01-115.20 micaceous, well bedded; Some coal frags. 115.29-115.80 mod. weak, silty fine sandstone w. s. clay infilled slick. joint, thin c. sandstone interbeds. 115.80-116.20 mod. weath., mod. str., mass., c. granitic sandstone 116.54-118.20 mod. weath., sheared, mass., weak, sandy, clayey siltstone w. some sandstone interbeds.
	5.0	40	100	116					1.3			
				117								117.23-116.75 mod. str., sandstone
	5.0	40	100	118					3.3			118.07-118.11 c. sandstone. 118.20-118.80 str., highly fract. granodioritic sandstone w. siltstone interbeds one carb. infilled joint.
	5.0	40	100	119					3.9			118.80-120.25 sl. to mod. weath., mod. str., mass., c. sandstone and siltstone interbeds. Some coal frags. 119.72-119.78 brecc., sheared, sandy siltstone.
				120								

Contractor: TONTO

Logged by: MR

Remarks:

Date started: 23 JUNE 78

Checked by: RE

Date finished: 28 JUNE 78

Date: 25 JUNE 78

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868
Sheet 13 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	120								GRANODIORITIC SANDSTONE CONT.
	7.0	39	100	121					3.9			120.25-120.51 highly weath., weak to mod. str., fract., probably brecc., c. sandstone; some sandy siltstone interbeds; sheared. 120.51-120.63 sandy siltstone and a 0.01 m coal band. 121.26- brown, sandy, siltstone (0.01 m). 121.40-121.77 mod. str.,c. sandstone. 121.80-121.92 v. weak, sandy siltstone. 122.08-122.71 sl. weath., mass., str., c. sandstone. 122.91-122.98 highly weath., brown, v. weak, sandy siltstone some med. green siltstone.
	6.0	16	100	122					6.6			
	6.0	33	100	123					4.6			121.88-123.44 highly weath., v. fract., v. weak, c. sandstone grading to silty, fine sandstone Some thin carb. beds. 123.44-123.49 dk. brown to black, v. weak, carb., sandy siltstone. 123.49-124.00 mod. str. med. to c. sandstone w. a 0.05 m. carb. clayey siltstone bed.
	7.0	39	100	124					3.3			124.00-126.00 mod. weath., brecc. greyish-green interbedded siltstone and med. to c. sandstone. 125.00-126.00 mod. weath., brecc. and sheared, brown, carb. sandstone and blackish-brown carb. siltstone.
	7.0	47	100	125					2.6			126.00-129.68 sl. weath., mass., med. green, mod. weak, silty claystone, and clayey siltstone.
	10.0	59	95	126								
				127								
				128								128.32-128.40 Sample #36, M.C. 128.40-128.56 Sample #37, Att. L.
				129			MC 46.0					
	9.0	35	95	130								129.68-132.94 sl. to mod. weath. mass., med. green, weak, med. to c., granodioritic sandstone w. some siltstone interbeds; many friable areas.

Contractor: TONTO
Logged by: MR
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 25 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH | Coordinates 79,168 N, 12,542 E | **DRILLHOLE No. 78-868** Sheet 14 of 20

Rig LONGYEAR 38 TRUCK MOUNT | Dip 90° | Location SLIDE AREA

Bit HQ DIAMOND | Azimuth | Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	130								GRANODIORITIC SANDSTONE cont'd
	6 0	18	96	131								130.15-131.67 brecc. and shearing along claystone interbeds; sandstone v. friable. 131.96-132.10 carb., sl. sheared, blackish-brown, siltstone. 132.26-132.30 bluish-brown, sheared mod. weak, silty claystone. 122.30-133.20 mod. weath., v. weak, poorly cemented granodioriticsandstone w. contorted carb. lam.
26/6 AM	10	78	96	132			MC 14.4 UCS 295 (42.8)	65	2.0			132.68-132.71 Sample #38, M.C. 132.71-132.94 Sample #39,Uniaxial
	7	48	84	133				76				133.20-133.42 sheared, lt. greenish-brown, weak, silty sandstone. 133.42-133.94 broken and sometimes friable sandstone.
				134	954.50				0			133.94-135.28 sl. weath., sheared, greyish-blue to brown, v. weak CLAYSTONE; tr. fine sand.
							MC 36.3	79			L.C.	134.19-134.40 Sample #40,Triaxial 134.40-134.44 Sample #41, M.C. Contact at 73°.
				135	953.16							
	9	38	66	135.28					.7		L.C.	135.28-145.52 sl. weath., mass., med. green to grey green, mod. str. to str. fine to c. CONGLOMERATE; subrounded to rounded volc. gravels in a silty sandstone matrix; occ. a dk. green, v. fine siliceous matrix. 135.28-135.45 med. green, v. weak sandy, clayey siltstone w. some shearing. 136.25-136.65 conglomeratic silty sandstone. 136.65-137.30 congl. is c. and clast supported.
	7 0	38	68	136								
				137					0			
											L.C.	137.77-138.36 sheared, brecc., weak, sandy siltstone. 137.90-138.12 Sample #42,Uniaxial 138.12-138.14 Sample #43, M.C. 138.36-139.00 conglomeratic, silty sandstone; some slight shearing.
	10 0	100	100	138				37				
							UCS 417 (60.5) MC 34.9		0			
				139								139.00-139.30 med. to c. congl. 139.30-139.86 fine to med. congl. 139.86- med. to c. congl.; some loose gravel.
		34	60	140								

Contractor: TONTO | Logged by: MR/AH

Date started: 23 JUNE 78 | Checked by: RE

Date finished: 28 JUNE 78 | Date: 26 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 15 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	140								CONGLOMERATE CONT.
									0		L.C.	140.85-140.89 soft, sandy siltstone matrix.
	3	20	40	141					0		L.C.	141.29-141.43 soft, sandy, rubbly congl.
		0	27	142					0		L.C.	143.87-144.40 washed and rubbly, partly conglomeratic, sandy, clayey siltstone.
	10	0	35	143							L.C.	145.39-145.52 conglomeratic fine sandstone.
	7	86	97	144	942.92				4.0			145.52-157.21 sl. weath., brecc., med. greyish-green, weak to mod. str., CLAYEY SILTSTONE and SANDY SILTSTONE w. some interbedding sandstone; some shearing. 146.00-146.12 conglomeratic lens. 146.53-146.64 wedge of hard sandstone.
	5	92	100	145			MC 29.3 UCS 642 (93.1)		2.0			147.29-147.33 Sample #44, M.C. 147.33-147.55 Sample #45, Uniaxial 148.44-148.54 Sample #46, Att. L.
	6	45	100	146					4.0			149.02-149.11 silty sandstone. 149.61-149.72 wedge of hard sandstone. 149.92-150.10 mod. str., silty sandstone.
				147								
				148								
				149								
				150								

Contractor: TONTO
Logged by: AH
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 26 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 16 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	150								CLAYEY & SANDY SILTSTONE CONT.
	9	68	100	151					2.0			150.85-151.26 med. grey, mass., weakly cemented, fine congl. 151.35-151.46 silty sandstone. 151.49-151.67 fine to med. poorly cemented congl. 151.79-152.12 mod. str., silty fine sandstone.
	5	14	54	152					2.0		L.C.	152.23- a med. gravel in the siltstone.
	5	82	100	153			MC 25.4 UCS 417 (60.5)		1.3			153.01-153.64 dk. green, weak, claystone w. some brecc. 153.40-153.41 Sample #47, M.C. 153.41-153.64 Sample #48, Uniaxial 153.64-154.70 v. weak, brecc., dk. green claystone w. some shearing
	9	84	100	154								154.42-154.52 Sample #49, Att. L. 154.70-155.94 v. brecc. and sheared, shaly in places, brownish-green, v. weak claystone; some sl. carb. horizons.
	13	89	100	155				38	1.3			
				156								156.10-157.21 sl. weath., v. brecc., sheared, weak, med. brown sl. carb. claystone. Contact @ 29°.
				157					0			
26/6 PM				157.21								157.21-161.80 sl. weath., mass., greyish-green, str., med. to c. CONGLOMERATE; subrounded to rounded, volc. gravel in a silty sandstone or dk. green v. fine siliceous matrix; generally clast supported; generally sl. calc.; some sandstone interbedding. 157.21-157.22 hard, off-white, tuff., siltstone layer parallel to contact.
	1	-86	96	158					0			
				159								
	14	67	100	160								159.83-160.14 med. green, mod. str., silty fine to med. sandstone.

Contractor: TONTO
Logged by: AH
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 26 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE POLYMER FLUSH

Coordinates 79,168 N
12,542 E

DRILLHOLE No. 78-868
Sheet 17 of 20

Rig LONGYEAR 38 TRUCK MOUNT

Dip 90°

Location SOUTHEAST PIT SLOPE

Bit HQ DIAMOND/NQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	160								CONGLOMERATE CONT.
									0			160.00 onwards, hole tight and drilling fluid return erratic.
	13	55	98	161					0			161.42-161.80 grey-green, mod. weak, silty conglomeratic med. to c. sandstone. Calcite infillings.
				161.80	926.64							161.80-173.30 sl. weath., mass., med. green, mod. weak, silty fine to c. SANDSTONE; occ. congl.
	16	52	52	162					0		L.C.	161.80-162.92 med. green, c. sand stone. 162.92-168.25 med. green, mod. weak, silty fine sandstone w.some white hard infillings along fract
				NQ								
27/6 AM	9 10	31	31	163					0		L.C.	
				164					0			164.25-164.38 conglomeratic sandstone. 164.30-165.60 brecc. sandstone w. some shearing.
	8 0	78	100	165								165.35-165.45 brecc. sandstone w. some shearing. 165.57-165.79 brecc. sandstone. 165.93-166.02 conglomeratic silty sandstone.
	8 0	48	94	166					.7			166.26- a sheared, undulating joint along core axis. 166.45-166.73 conglomeratic silty sandstone. 166.96-167.36 sandy siltstone. 166.73-168.25 many sheared joints.
	6 0	38	94	167			MC 23.8		4.7			167.05-167.13 Sample #50, M.C. 167.36-167.51 conglomeratic sandstone.
				168								168.25-172.00 fine to med. congl. w. a weak silty fine to c. sandstone matrix; friable zones. 168.81-168.94 silty, med. sandstone.
	9 0	58	100	169					0			
				170								

Contractor: TONTO

Logged by: JT/AH

Date started: 23 JUNE 78

Checked by: RE

Date finished: 28 JUNE 78

Date: 27 JUNE 78

Remarks: Reduced hole to NQ at 162.92
N casing to 162.76

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: NQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 18 of 20.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50									SANDSTONE CONT.
	7 0	54	54	170					0		L.C.	
				171								
	6 0	87	100	172					2.0			172.00-172.33 med. green, mod. weak, silty fine sandstone; one fract. w. hard white infilling 172.33-173.30 med. green, mod. weak, silty med. to c. sandstone.
				173								
				173.30	915.14							173.30-199.95 E.O.H. weath., dk. brown and grey-green, totally brecc. and sheared, v. weak, fine grain, SILTY CLAYSTONE, CLAYEY SILTSTONE and SANDY CLAYEY SILTSTONE w. some thin seams of silty fine to med. sandstone and some zones of v. rubbly core. 173.53-173.57 Sample #51, M.C. 173.57-173.68 Sample #52, Att. L
	9 0	38	98	174					2.7			
							MC 26.6					
	9 0	0	100	175								174.35-175.87 v. broken, sheared, clayey sandy siltstone.
				176								
	14	11	100				MC 27.3		5.7			176.75-176.79 Sample #53, M.C.
27/6 PM				177								177.10-183.16 dk. brown v. weak sheared silty claystone. Occ. sandy siltstone; highly fract., slick. surfaces. 177.92-178.03 sandy siltstone.
	12 0	12	90						3.9			
				178								
				179								
	13 0	16	88				UCS 3856 (559.6)		4.6			179.93-180.10 Sample #54, Uniaxial M.C.
				180							L.C.	

Contractor: TONTO
Date started: 23 JUNE 78
Date finished: 28 JUNE 78
Logged by: AH/IT
Checked by: RE
Date: 27 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: NQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 19 of 20

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				180							L.C.	SILTY CLAYSTONE, CLAYEY SILTSTONE & SANDY SILTSTONE CONT.
	14.0	15	100	181					3.9			
	14.0	7	100	182					2.7			182.50-183.19 highly sheared zone w. some clayey, gouge infilled fracts; slick. surfaces. 182.98-183.16 brown v. weak, fine sandy clayey siltstone.
	12.0	18	100	183					2.3			183.16-183.19 pale green, v. weak soapy textured, partly plastic tuff. claystone. 183.71-184.71 grey green, v. weak to mod. str. sheared silty fine to med. sandstone w. occ. fine gravel.
	15.0	48	96	184								184.71-185.03 med. green, v. weak brecc., rubbly, clayey siltstone.
	15.0	0	95	185					0			185.03-185.58 grey green, mod. str., sheared med. sandstone. 185.58-192.30 v. weak totally brecc. and sheared, med. green siltstone. Rubbly core, slick. surfaces.
	11	0	92	186					0			187.20-187.24 Sample #55, M.C.
	12	0	100	187					0			
				188					0			
				189								
				190								

Contractor: TONTO
Logged by: IT
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 27 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE POLYMER FLUSH
Coordinates: 79,168 N, 12,542 E
Rig: LONGYEAR 38 TRUCK MOUNT
Dip: 90°
Location: SLIDE AREA
Bit: NQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-868

Sheet 20 of 20

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	190					0			SILTY CLAYSTONE, CLAYEY SILTSTONE & SANDY SILTSTONE CONT.
	1	5	100	191					0			
				192								192.30-193.90 med. green, v. weak totally brecc. and sheared, clayey siltstone. Rubbly core.
	1	7	96	193					0			193.90-194.62 grey green, mod. weak, silty med. sandstone.
	18	22	94	194			UCS 447 (64.9)		3			194.20-194.37 Sample #56, Uniaxial M.C. 194.62-199.95 med. green, v. weak totally brecc., and sheared clayey siltstone. Rubbly core.
	10	0	98	195					0			
				196								
	12	01	90	197					0			
				198								
	11	0	98	199					0			
				200								199.95 END OF HOLE.

Contractor: TONTO
Logged by: IT
Date started: 23 JUNE 78
Checked by: RE
Date finished: 28 JUNE 78
Date: 28 JUNE 78

Remarks: No survey - hole collapsed below rods.

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE MUD FLUSH

Coordinates 82,990 N
22,991 E

DRILLHOLE No. 78-870
Sheet 1 of 26

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location NORTHEAST PIT SLOPE

Bit HW TRICONE

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	0	966.98							
				0.40	966.58							
25/6 PM	15.0			HW Tricone 1								0.40-110.5 fine to med., subrounded to subangular GRAVEL w. occ. cobbles in a multicoloured loose, silty SAND matrix Gravel composed of volcs., limestones and baked claystone. Lower contact identified from focused beam geophysics log. 0.40-55.17 Triconed.
	13.0			2								
				3								
				4								
				5								
	9.0			6								
				7								
				8								
	15.0			9								
				10								

Contractor: TONTO

Logged by: MM

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 25 JUNE 78

Remarks: FINAL HW CASING DEPTH 30.48 m.

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 82,990 N, 22,991 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Bit: HW TRICONE

Azimuth:

DRILLHOLE No. 78-870

Sheet 2 of 26

Location: NORTHEAST PIT SLOPE

Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	10								SAND & GRAVEL CONT.
	10.0			11								Triconed to 55.17 m.
				12								
				13								
	11.0			14								
				15								
				16								
				17								
	9.0			18								
				19								
				20								

Contractor: TONTO

Logged by: MM

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 25 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 82,990 N, 22,991 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: NORTHEAST PIT SLOPE

Bit: HW TRICONE

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 3 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	20								SAND & GRAVEL CONT
	0.0											Triconed to 55.17 m.
				21								
				22								
	5.0			23								
				24								
				25								
				26								
	10.0			27								
26/6 AM				28								
				29								
				30								

Contractor: TONTO

Logged by: MM

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE MUD FLUSH

Coordinates 82,990 N
22,991 E

DRILLHOLE No. 78-870
Sheet 4 of 26

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location NORTHEAST SLIDE AREA

Bit HW TRICONE & NW TRICONE

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				30								SAND & GRAVEL CONT.
												Triconed to 55.17 m.
				NW TRICONE								
				31								
				32								32.00-35.05 fine silt and fine sand in cuttings.
				33								
				34								
				35								
				36								
				37								
				38								
				39								
				40								

Contractor: TONTO

Logged by: MM

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: JUNE 78

Remarks: HW CASING TO 30.48 m. CHANGED TO NW TRICONE at 30.48 m.

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: NW TRICONE
Azimuth:

DRILLHOLE No. 78-870
Sheet 5 of 26

Location: NORTHEAST PIT SLOPE
Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m (10, 20)	R.Q.D. (0, 50)	Core Recovery % (0, 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				40								SAND & GRAVEL CONT.
												Triconed to 55.17 m.
				41								35.05-41.15 med. to c. sand and silt in cutting return, probably gravels in a med. to c. silty sand matrix.
				42								
				43								41.15-47.24 c. sand and subangular gravels in a silty matrix.
				44								
				45								
				46								
				47								47.24-50.29 subangular, dk. grey gravels in a fine to med. silty sand matrix. Alternate fast drilling and rig bouncing suggest occ. cobbles and/or boulders.
				48								
				49								
				50								

Contractor: TONTO
Logged by: MR
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 26 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: NORTHEAST P.I.T. SLOPE
Bit: NW TRICONE/HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 6 of 26.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	50								SAND & GRAVEL CONT.
												Triconed to 55.17 m.
				51								51.80- boulders.
				52								50.24-53.34 occ. cobbles and boulders in a uniform fine to med sand matrix.
				53								
				54								
				55								
				HQ								55.17-67.06 fine to med. sub-rounded to subangular gravels and cobbles in a multicoloured med. sand matrix. Very little matrix recovered. Matrix appears predominately as silty sand, occ. clayey silty sand.
	9		50	56							L.C.	
	16		13	57							L.C.	57.41-59.44 . occ. broken silt-stone pebbles.
26/6 PM	30		20	58								
				59							L.C.	
				60							L.C.	

Contractor: TONTO
Logged by: MR
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 26 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE/ROTARY MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: NORTHEAST PIT SLOPE
Bit: HQ DIAMOND/ NW TRICONE
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 7 of 26.

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	60								SAND & GRAVEL CONT.
	8.0		12								L.C.	
				61								
	15.0		16								L.C.	
				62								
	8.0		26									
				63							L.C.	
				64								
	10.0		0									
				65								
	10.0		12	66							L.C.	
				67								67.06-91.75 Triconed through sands and gravels.
				NW Tricone								Drill "bouncing around" indicating c. granular material. Fluid return contains silty to clean, fine to med. multicoloured sand.
				68								
	8.0											
				69								
				70								

Contractor: TONTO
Logged by: IT
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 26 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE MUD FLUSH

Coordinates 82,990 N
22,991 E

DRILLHOLE No. 78-870
Sheet 8 of 26

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location NORTHEAST PIT SLOPE

Bit NW TRICONE

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	70								SAND & GRAVEL CONT.
												Triconed to 91.75 m.
	5.0			71								
				72								
				73								
				74								
				75								
	8.0			76								
				77								
				78								
				79								
				80								

Contractor: TONTO Logged by: JT

Date started: 25 JUNE 78 Checked by: RE

Date finished: 30 JUNE 78 Date: 26 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 82,990 N, 22,991 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: NORTHEAST PIT SLOPE

Bit: NW TRICONE

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 9 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	80								SAND & GRAVEL CONT.
												Triconed to 91.75 m.
	8.0			81								
				82								
				83								
				84								
				85								
				86								
	8.0			87								
				88								
				89								
				90								

Contractor: TONTO

Logged by: JT

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 26 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: NW TRICONE/HQ DIAMOND
Azimuth:
Location: NORTHEAST PIT SLOPE
Reference elevation: DRILL FLOOR

DRILLHOLE No. 26-870

Sheet 10 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 10	0 50	0 50	90								SAND & GRAVEL CONT.
												Triconed to 91.75 m.
				91								
				HQ								
	5 10		92	92								91.75-97.84 uncohesive multi-coloured fine to med., sand and fine to med., subrounded, mostly volc. gravel w. occ. cobbles; baked claystone frags.; trace silty sand; some fine to med. limestone gravels.
				93								
	9 10		90	94								
27/6 AM				95								
	12 0		100	96								
	14 0		100	97			MC 14.4					97.84-122.22 Triconed through sands and gravels.
				NW								
	15 0			98 Tricone								98.70-98.74 Sample #1 Density
				99								
				100								

Contractor: TONTO
Logged by: IT/MR
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 27 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 82,990 N, 22,991 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Bit: NW TRICONE

Azimuth:

DRILLHOLE No. 78-870
Sheet 11 of 26

Location: NORTHEAST PIT SLOPE

Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	100								SAND & GRAVEL CONT.
												Triconed to 122.22 m.
	3.0			101								
				102								102.11-105.16 fine to med. gravels in silty, sandy matrix.
				103								
	3.0			104								
				105								
				106								
	3.0			107								
				108								
				109								
	1.0			110								

Contractor: TONTO

Logged by: MR

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 27 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: NORTHEAST PIT SLOPE
Bit: NW TRICONE
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870
Sheet 12 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Foi.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	110								SANDS & GRAVELS CONT.
				110.50	856.48							Triconed to 122.22 m. 108.20-110.50 gravels in a c. sand matrix. 110.50-138.27 c. GRAVEL and COBBLES, rounded and subangular in a medium to c., multicoloured SAND matrix. Bedding discernable.
	1.0			111								
	2.0			112								
				113								
				114								
	10.0			115								
				116								
				117								117.35-120.40 gravels in a c. sand matrix (tricone cuttings).
				118								
	3.0			119								
				120								

Contractor: TONTO
Logged by: MR
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 27 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: NW TRICONE/HQ DIAMOND
Azimuth:

DRILLHOLE No. 78-870

Sheet 13 of 26

Location: NORTHEAST PIT SLOPE
Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	120								SAND, GRAVEL & COBBLES CONT.
	11.0			121								
				122 HQ								122.22-138.27 varicoloured, rounded and subangular c. gravel and cobbles of basalt, coldwater med. green sandstone, and dk. brown claystone in fine to med. multicoloured, med. to c. sand matrix. Bedding in sands are discernable. Sands widely graded into fine and med. grain fracts.
27/6 PM	13.0		100	123								
	15.0		100	124								
				125								125.17-125.35 Sample #2, Density.
	18.0		100	126								
				127								127.36-127.44 Sample #3, Density.
	17.0		100	128			MC 26.8					
	18.0		96	129								129.77-129.75 brown silty, clay layer. 129.85-138.27 occ. gravels and cobbles.
				130								

Contractor: TONTO
Logged by: IT
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 27 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:
Location: NORTHEAST PIT SLOPE
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 14 of 26

Drilling Progress	Rate of Advance Min./m (10 20)	R.Q.D. (0 50)	Core Recovery % (0 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				130								SAND, GRAVEL & COBBLES CONT.
	14.0		100	131			MC 29.9					131.37-131.42 Sample #4, Density. 131.82-132.04 varved grey, clayey silt. Partly plastic.
	13.0		100	132								132.77-133.93 frags. black shiny coal.
	13.0		100	133								133.80-133.87 stiff, brown silty clay or claystone boulder.
				134								134.18-134.27 Sample #5, Density.
	16.0		100	135								
	16.0		100	136								
	18.0		100	137								
				138			MC 48.5					137.96-138.02 Sample #6 Density 138.20-138.26 Sample #7, M.C.
				138.27								138.27-146.07 dk. greyish green, uniform, mod. dense to dense, lam., silty fine SAND w. some thin layers fine sand and occ. clasts (coal, quartzite, etc.).
				139			MC 23.3					
	8.0		100	140								

Contractor: TONTO
Logged by: IT/MR
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 27 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 82,990 N, 22,991 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Bit: HQ DIAMOND

Azimuth:

DRILLHOLE No. 78-870

Sheet 15 of 26

Location: NORTHEAST PIT SLOPE

Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed/Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	140								SAND CONT.
								90				140.00-143.00 lam. at 90° to C.A.
	8		100	141								
				142								
	13.0		88	143								
								85			L.C.	
	7.0		100	144			MC 28.2 UCS 501 (72.6)					144.59-144.67 Sample #8, M.C. 144.67-144.89 Sample #9, Uniaxial
	12.0		55	145								
				146	820.91							
				146.07							L.C.	146.07-152.70 dk. brown, uniform, firm sandy SILT; occ. gravels, some fine sand bands.
	13.0		100	147								
				148								
	18.0		50	149								148.22-148.43 fine to med. gravels in firm sandy siltstone matrix.
											L.C.	
28/6 AM				150				85 to 90				

Contractor: TONTO

Logged by: IT/MR

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 28 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:

DRILLHOLE No. 78-870
Sheet 16 of 26
Location: NORTHEAST PIT SLOPE
Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m (10, 20)	R.Q.D. (0, 50)	Core Recovery % (0, 50)	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
				150								SILT CONT.
	11.0		100	151								
	12.0		100	152								
				152.70	814.28							152.70-168.00 dk. greyish green, loose to dense, uniform clean MEDIUM SAND interbedded w. SILTY, FINE SAND, occ. fine gravels and occ. coal frags.
								80				
	12.0		100	153								
				154								
	15.0		100	155								
												155.80-157.94 silty fine sand.
	20.0		100	156								
				157								
	18.0		100	158								
												158.90-158.98 Sample #10, M.C.
	16.0		100	159								
				160								

Contractor: TONTO
Logged by: HR
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 28 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 82,990 N, 22,991 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: NORTHEAST PIT SLOPE

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 17 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	160								MEDIUM SAND & SILTY FINE SAND CONT.
	21.0		85	161								160.40-160.48 coal cobble. 160.48-162.10 disseminated fine coal frags. in dense uniform sand.
											L.C.	
	19.0		100	162								162.50-162.58 Sample #11, M.C.
				163								
	18.0		100	164								
				165								
	13.0		100	166								165.56-165.75 Sample #12, M.C.
	18.0		100	167			MC 32.5					166.70-166.79 Sample #13, Density 166.78-166.85 Sample #14, M.C.
				168	798.98							168.00-171.00 Interbedded COARSE SAND, CLAY and FINE TO MEDIUM SAND w. fine to med., subrounded gravels. 168.00-169.50 loose, c. sand w. gravels, some coal frags.
	13.0		53	169							L.C.	
				170								169.50-169.70 fine gravels in a brown clay matrix. 169.70-171.00 fine to med. sand w. med. green siltstone frags.

Contractor: TONTO

Logged by: MR

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 28 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH

Coordinates: 82,990 N, 22,991 E

Rig: LONGYEAR 44 WIRELINE

Dip: 90°

Location: NORTHEAST PIT SLOPE

Bit: HQ DIAMOND

Azimuth:

Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 18 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	170								SAND & CLAY CONT.
	19.0		47								L.C.	
				171	795.98							171.00-182.15 dk. greyish-green, weak gravelly TILL w. c. clayey silty sand matrix, fine to c. gravels and cobbles
	13.0		90	172								
	16.0		40	173							L.C.	
28/6 PM				174								
	18.0		91	175								
	20.0		90	176								
				177								
	23.0		22	178							L.C.	
				179								
	16.0		52								L.C.	
				180								

Contractor: TONTO

Logged by: MR/JG

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 28 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: NORTHEAST PIT SLOPE
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 19 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	180								TILL CONT.
	25.0		48	181							L.C.	180.35-180.70 compact, dk. green silty, v. fine sand.
				182							L.C.	181.92-182.15 volc. boulder.
	25.0		84	182.15	784.83				0.7		L.C.	182.15-250.24 E.O.H. sl. weath., med. grey to greyish-green, v. weak to mod. str., mass. to sheared and brecc. CLAYEY SILTSTONE. Very weak along bedding at 65° to 80° to C.A. Some slickensided joints and some extremely brecc. zones occ. sandstone seams and occ. extremely str., calc. horizons.
	20.0	82	100	183			LL 92.9 PL 31.7 UCS 752 (109)		0.7			182.15-183.18 siltstone is weak and brecc. 183.50-184.14 weak brecc. zone. 183.99-184.14 Sample #15 Att. L.
	25.0	92	100	184				30	0.7			184.14-184.36 Sample #16 Uniaxial 184.43-184.53 creamy, silty tuff. band bedded at 30°. 184.70-188.28 siltstone is brecc.
				185								185.00-185.21 Sample #17 Triaxial 185.22-185.41 Sample #18 Triaxial 185.42-185.62 Sample #19 Triaxial 185.85-185.90) clayey tuff. bands 186.00-186.20)
	24.0	85	93	186					0.7			N.B. The unbrecciated material separates along closely spread rectilinear features existing in three "isometrically" oriented systems.
				187			UCS 574 (83.3)		0			186.66-186.92 Sample #20 Triaxial 186.92-187.12 Sample #21 Uniaxial
	23.0	98	100	188					0			188.45-188.67 Sample #22 Uniaxial
				189			UCS 456 (66.1)					
	13.0	90	100	190					0			

Contractor: TONTO
Logged by: JG
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 28 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: NORTHEAST PIT SLOPE
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 20 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	190								CLAYEY SILTSTONE CONT.
	23.0	88	100	191					0			190.60-195.30 v. weak, mass., brecc., clayey siltstone.
				192								
29/6 AM	16.0	80	100	193					0			193.85-194.03 highly brecc., v. weak, sandy siltstone.
	14	76	100	194					0.7			
				195								195.30-195.38 lt. brown, mod. str., fract., sandy siltstone. 195.38-197.43 med. green, sl. to mod. weath., interbedded, v. weak med. grained sandstone, clayey siltstone, claystone and sandy siltstone; dk. brown infilling along some lam. at 55° to C.A.
	18	74	100	196				55	0.7			195.38-195.45 med. sandstone. 195.65-195.75 med. sandstone. 195.92-196.80 med. sandstone. 196.70-196.80 med. sandstone. 196.80-197.43 mass., v. weak, claystone.
				197				60				
	17	60	100	198				60	0.7			
								70				
	16	56	100	199			MC 15.7 23498 (3408)		2.9			199.14-199.20 Sample #23, M.C. 199.20-199.43 Sample #24, Uniaxial 199.20-199.50 brown, bedded, str., fine sandstone.
				200				70				

Contractor: TONTO
Logged by: MR
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 29 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:

DRILLHOLE No. 78-870

Sheet 21 of 26

Location: NORTHEAST PIT SLOPE
Reference elevation: DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed/Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50									CLAYEY SILTSTONE CONT.
	25	100	100	200					8.4			
	19	0	80	201			6199 (899)	70	7.7		L.C.	201.73-201.75 Sample #25,Uniaxial
	15	56	100	202			MC 36.1		3.9			202.56-202.62 Sample #26, M.C. 202.62-202.92 Sample #27,Triaxial
	20	43	100	203					3.3			203.00- Some steep deeping joints.
	23	60	100	204					1.3			203.91-208.32 mod. str., well bedded, fract. brown sandy clayey siltstone, v. weak along bedding.
	26	48	100	205				68				
	16	0	100	206				63 to 70	1.3			
				207			MC 22.9	80	.7			207.57-207.76 Sample #28,Uniaxial 207.76-207.81 Sample #29, M.C. 207.81-207.95 Sample #30,Att. L.
	14	50	100	208			UCS 3154 (472) LL 91.4 PL 34.9		1.3			208.00- Sub-vertical joints.
	20	20	100	209					0			209.00-211.08 several high angle joints present.
				210								

Contractor: TONTO
Logged by: MR/JG
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 29 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE MUD FLUSH | Coordinates 82,990 N, 22,991 E | **DRILLHOLE No. 78-870** Sheet 22 of 26

Rig LONGYEAR 44 WIRELINE | Dip 90° | Location NORTHEAST PIT SLOPE

Bit HQ DIAMOND | Azimuth | Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	210								CLAYEY SILTSTONE CONT.
												210.00- caved-geophysical probe would not pass through.
29/6 PM				211								211.16-211.76 v. brecc. zone.
	2.4.0	0	92	212								212.30-213.66 siltstone is brecc. and very sheared.
	2.4.0	0	92	213								
	2.4.0	70	100	214				75	2.0			
				215								Core breaks prefeventially along bedding.
	3.0	64	100	216			LL 79.5 PL 38.2	74	1.3			216.98-217.33 Sample #31,Uniaxial 216.14-216.35 Sample #32, Att. L.
	3.0	60	100	217			UCS 7511 (1089.3)	81	0			Core exhibits occ., v. thin discontinuous vertical cracks, poss. due to hydraulic fracturing.
				218				77				218.78-218.98 Sample #33,Triaxial 218.98-219.19 Sample #34,Triaxial
	3.0	100	100	219				75	0			
								68				Core is mod. str., yet separates spontaneously along bedding.
				220				78 70				

Contractor: TONTO | Logged by: JG | Remarks:

Date started: 25 JUNE 78 | Checked by: RE

Date finished: 30 JUNE 78 | Date: 29 JUNE 78

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Bit: HQ DIAMOND
Azimuth:
Location: NORTHEAST PIT SLOPE
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 23 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50	220								CLAYEY SILTSTONE CONT.
	0	88	100				LL 77.1 PL 35.2	76	0.7			220.26-220.60 Sample #35, Att. L. 220.58-220.98 core exhibits spiral fract. due to drilling.
				221			UCS 8428 (1222.4)	69				221.15-221.36 Sample #36, Uniaxial 221.46-221.51 Sample #37, M.C.
	0	97	100				MC 18.3	71	1.3			
				222								
	0	44	100	223				72 72	.7			
				224			LL 73.3 PL 35.1					224.03-224.18 Sample #38, Att. L.
	0	40	100	225				70	2.0			Note: there is no sample #39.
				226			UCS 2241 (325)	61	1.3			226.16-226.32 Sample #40, Triaxial 226.39-226.59 Sample #41, Uniaxial
	0	82	100	227								
	0	78	100	228				69	1.3			228.06-228.25 brecc. zone. Siltstone is extremely str.
				229				71				
	0	60	100				LL 76.8 PL 31.7		2.7			229.04-229.19 Sample #42, Att. Limits.
				230				65				

Contractor: TONTO
Logged by: JG
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 29 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling: ROTARY CORE MUD FLUSH
Coordinates: 82,990 N, 22,991 E
Rig: LONGYEAR 44 WIRELINE
Dip: 90°
Location: NORTHEAST PIT SLOPE
Bit: HQ DIAMOND
Azimuth:
Reference elevation: DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 24 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	0 10 20	0 50	0 50	230								CLAYEY SILTSTONE CONT.
	8.0	60	100					75				230.46-230.59 brecc. zone. 230.59-230.70 limestone calcite infilled fracts. 230.70-231.49 creamy brown to v. lt. bluish-green, waxy tuff weath., bedding becomes steeper w. depth.
				231				50				
								69				231.49-231.57 lt. brown, bedded weak sandstone, bedded orthogonally to overlying bedding.
	8.0	100	100	232			UCS 8177 (1186) LL 82.8 PL 36.2	77	.7			231.57-232.70 v. str., mass., med. greenish-brown siltstone. 231.90-232.15 Sample #43,Uniaxial 232.15-232.32 Sample #44, Att. L 232.70- Contact at 68°. 232.70-233.17 mass., extremely str., extremely calc. siltstone and sandstone, bedded at 68°.
				233				68				
	8.0	61	93	234				69	2.0			233.17-250.24 mass., v. str., med., grey-brown siltstone, many joints approx. perpendicular to bedding.
30/6 AM	8.0	21	100	235				78	4.0			235.30-237.30 core is v. heavily fract. w. many sub-vertical joints, but no evidence of shearing.
				236								
	8.0		100	237				78	1.3			237.30-238.20 siltstone is weak along bedding.
	8.0		100	238				78	.6			238.50- vertical fract.
			100	239			MC 18.8	79	1.3			239.06-241.00 mod. weak to mod. str., unfractured siltstone. 239.25-239.32 Sample #45, M.C. 239.32-239.57 Sample #46,Uniaxial
				240								

Contractor: TONTO
Logged by: JG/MR
Date started: 25 JUNE 78
Checked by: RE
Date finished: 30 JUNE 78
Date: 30 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE MUD FLUSH

Coordinates 82,990 N, 22,991 E

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location NORTHEAST PIT SLOPE

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

DRILLHOLE No. 78-870

Sheet 25 of 26

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	10 20	0 50	0 50									CLAYEY SILTSTONE CONT.
		100	100	240					0			
		60	100	241					.7			
		95	100	242					.7			243.55-243.85 str. calc. siltstone
		50	100	243					2.0			244.10-245.07 weak, v. fract. siltstone. 244.14-247.19 core broken along sub-vertical joints, some slickensided joints. 245.67-245.88 Sample #47, Uniaxial 245.55-245.95 Sample #48, M.C. 245.95-246.25 Sample #49, Triaxial.
		89	100	244					.7			
		60	100	245					2.0			247.40-247.51 mod. str., sandy siltstone.
		100	100	246				80				248.24-248.48 mod. str., mass., lt. brown, sandy siltstone. 248.50-248.72 mod. weak, siltstone v. weak along bedding. 248.72-250.24 fresh, mod. weak to mod. str., unfractured, mass., clayey siltstone.
				247								
				248								
				249								
				250								

Contractor: TONTO

Logged by: MR

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 30 JUNE 78

Remarks:

Golder Associates

Scale: 1:50 metric

Type of drilling ROTARY CORE MUD FLUSH

Coordinates 82,990 N
22,991 E

DRILLHOLE No. 78-870
Sheet 26 of 26

Rig LONGYEAR 44 WIRELINE

Dip 90°

Location NORTHEAST PIT SLOPE

Bit HQ DIAMOND

Azimuth

Reference elevation DRILL FLOOR

Drilling Progress	Rate of Advance Min./m	R.Q.D.	Core Recovery %	Depth m	Reduced Level	Water Level	Test Results	Bed./Fol.	Fracture Index	Instrumentation	Legend	Description
	0 10 20	0 50	0 50	250								CLAYEY SILTSTONE CONT
				250.24	716.74							250.24 END OF HOLE
30/6 PM				251								
				252								
				253								
				254								
				255								
				256								
				257								
				258								
				259								
				260								

Contractor: TONTO

Logged by: MR

Date started: 25 JUNE 78

Checked by: RE

Date finished: 30 JUNE 78

Date: 30 JUNE 78

Remarks: Hole surveyed at 250 m 86.5°/348°.

Golder Associates

Scale: 1:50 metric

HC - HAT CREEK 78(3)B

GEOLOGICAL DESCRIP.

COLLAR DATA

00140

3/3

BOREHOLE

140

COLLAR DATA.

HOLE NUMBER 78-270

TYPE OF DRILLING DIAMOND NQ

PROPOSED:

DIP -70

AZIMUTH 90°

COORDINATES UTM

LATITUDE 5,625, 007.7

DEPARTURE 599, 136.6

ELEVATION

GROUND 913.6 m

REFERENCE 914.1 m

DATE

STARTED 20 JULY

COMPLETED 23 JULY

DRILLED BY V. HANSON, W.SONNENBERG

LOGGED BY M. SANFORD
G. GREEN

GEOPHYSICAL LOGS BY B. KLEOPFER, ROKE OIL

TYPES DENSITY, GAMMA

DIP TEST no.	DIP	AZIMUTH	DEPTH LENGTH
1	-71°	84.0	121.9
2			
3			
4			

DATE July 25th
LOGGED BY M. SANFORD

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	Thickness	AT	BEDDING % to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO	
0.0	✓																						
6.2		✓		56.2	56.5	CBL-BLDR		UNCONSOLI-DATED															BASALT &LIMESTONE
6.8		✓		56.5	61.7	SAND-SILT	LT.BL. GY.TO	H=1 TO UNCONSOL.	INTERBED. MODERATE SORTING	FINE						65 60	60.8 64.3	DISTINCT INDIST.					MINOR MED. GRAINED SAND.LIMY MATRIX.
9.8		✓					MED.LT. GY.																CRUMBLES WHEN DRY.
2.8		✓		61.7	62.0	SAND,GRVL & CBL	MED.LT GY.	H=1	POORLY SORTED														CONTACTS WITH UPPER & LOWER SAND-SILT UNITS ARE SHARP.
5.8		✓	0.1																				LIMY MATRIX.
6.4		✓	2.0	62.0	65.4	SAND-SILT	LT.BL. GY. TO MD.LT.GY	H=1 TO UNCONS.	INTERBED. MODERATE SORTING.	FINE													SAME AS 56.5-61.7
8.9	✓			65.4	71.0	SAND,GRVL & CBL.	MED LT GY.	H=1	POORLY SORTED.														CONTACT WITH OVERLYING SAND-SILT IS SHARP-CONTACT WITH COAL IS TRICONED-SAME AS 61.7-62.0
4.0		✓		71.0	98.0	COAL	BLK.	H=4 R1-55	SOME WOODY TEXTURE			5	CARB SH.	0.4m	83.5	40 40	90.3 93.8	INDIST. INDIST.	GEN. PULV. TO BLOCKY		71.0	100.0	PROBABLE FAULT ZONE.
6.5		✓																					SHEARING AND BRECCIATION COMMON.
7.7		✓		100.0	123.7 END	SLST.	LT.GY TO MED. GY.	H=3 TO 3.5 R1-55	FISSILE INTERBED.				ASH	0.2 0.1	101.7 106.0	35 40	107.5 108.0	DIST. COMPOS. LAYERNG	BLOCKY		100.0	123.7	CONTACT WITH COAL SHARP MORE RBLY & PULV. NEAR COAL CONTACT.
9.5		✓											CRS. SAND	0.1 0.1 0.2	110.0 111.9 114.9	40 30	110.1 115.0	"					
0.9		✓											Fe CO_3	0.1 0.1 0.3	108.3 115.4 120.2	15	119.0	"					
2.6		✓																					
3.5		✓	0.2																				

DATE July 25th

LOGGED BY M. SANFORD

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES																TECTONIC FEATURES			
				GEOLOGICAL INTERVAL		ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS			BEDDING			DESCRIPTION	% TO C.A.	INTERVAL	
				FROM	TO								TYPE	Thickness	AT	% to C.A.	AT	COMMENT			FROM	TO
84.1		✓	2.7																			
87.2		✓	0.7																			
90.2		✓	0.8																			
93.3		✓	0.2																			
96.3		✓	1.1																			
99.4		✓	0.7																			
02.4																						
05.5																						
08.5																						
11.6																						
12.6																						
14.6			0.2																			
15.2																						
17.7																						
20.7																						
23.7																						
END																						

140

COLLAR DATA.

HOLE NUMBER DDH-78-271

TYPE OF DRILLING NQ Diamond

COORDINATES

DIP 75°

AZIMUTH 270°

LATITUDE UTM 5,624, 977N

DEPARTURE 599, 134E

ELEVATION

GROUND 913.4m

REFERENCE 913.9m

DATE

STARTED 24/07/78

COMPLETED 31/07/78

DRILLED BY Coates Enterprises

LOGGED BY Paul Northrop
N. P. Crocker
M. Sanford

GEOPHYSICAL LOGS BY B.Kleopfer Roke

TYPES Gamma, Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	-79.5°	281.9°	180.7m
2			
3			
4			

DATE July 78

LOGGED BY N.P.C., P.N., M.S.

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO	
61.0		/		67.1	68.9	Coal	Blk.	R_1	Friable			L.5	Carb. Sh.	.2m	67.1	40°	69.1	Dist.	Rbly.		67.1	68.9	Conspicuous shears at 45° Axis appear directional. Top 6m Coal not cored.
68.9		/	20cm	68.9	69.4	Clst.	Med.Gy.	S_3	Massive										Intact		68.9	69.4	
71.2		/	0	69.4	77.4	Coal	Blk.	R_1	Friable			L.5							Shrd. Rbly.		69.4	77.4	Sheared at 45° to core axis also sheared vertical and horizontal.
73.2		/	0.3	77.4	78.8	Carb.Sh.	Ol. or Br.Blk.	S_4	Friable										Pulv.		77.4	78.8	
75.9		/	1.3	78.8	79.0	Coal	Blk.	R_1	Friable			L.5							Shrd. Rbly.		78.8	79.0	Only 10cm good coal grading into ash beds.
78.0		/	0.1	79.0	79.6	Ash	Lt.Ol. Gy.	R_1-R_2	Massive										Blocky		79.0	79.6	Harder than ash Contains carb. materials. Upper + lower contacts are sharp.
80.5		/	0.5	79.6	81.1	Coal	Blk.	R_1	Friable		Rsn	L.5	Ash Carb. Sh.	5cm	80.2				Blocky		79.6	81.1	Minor beds has sharp upper contact @45° to C.A.
83.5		/	0										"	7cm	80.5								Minor beds has sharp lower contact @25° to C.A.
86.3		/	0	81.1	82.5	Carb.Sh.	Ol. or Br.Blk.	S_4	Friable		Rsn.												
				82.5	85.2	Coal	Blk.					L.5							Blocky to Rbly.		82.5	85.2	
				85.2	87.0	Coaly Shale	Blk.	R_1				3-4							Pulv.to Rbly.Shrd		85.2	87.0	
88.1		/	0.2	87.0	89.2	Coal	Blk.	R_1			Sid.		Ash	10cm	87.7				Rbly.to Blocky		87.0	89.2	Convoluted Sid. veins over .3m at 88.5
89.9		/	0.2	89.2	89.8	Carb.Sh.	Ol. or Br.Blk.	S_5	Friable										Rbly.		89.2	89.8	
93.0		/	0	89.8	96.2	Coal	Blk.	R_1	Friable			L.5							Pulv.to Blocky, H. Shrd.		89.8	96.2	Sheared at 40° to C.A.
95.4		/	0	96.2	97.2	Irst.	Dk.Yel. Br. to Br.Blk.	R_2	Massive		Sid.								Blocky				Carbonaceous.
98.8		/	1.5	97.2	107.6	Coal	Blk.	R_1				L.5							Pulv.and Shrd.		92.2	102.6	Commonly banded at 5° to C.A.
																			Blocky		102.6	107.6	

DATE July 78
LOGGED BY N.P.C., P.N., M.S.

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∢ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∢ TO C.A.	INTERVAL FROM	INTERVAL TO	
100.9		/	0.5	107.6	109.7	Carb. Sh.	Br.Blk. to Lt. Ol.Gy.	S_4	Graded-Carb.Sh.to Mudstone										Shrd.Pulv. to Rbly.		102.6	109.7	Sharp contact underlying Ss. Grade contact overlying Coal.
102.4		/	0.1	109.7	110.6	Ss.	Yel.Gy.		Poorly Sorted	Med.									Rbly.		109.7	110.6	
104.5		/	0.3	110.6	131.7	Coal	Blk.	R_1	Massive				Carb. Sh.	20cm	110.6				Intact to Blocky		110.6	113.1	
107.0		/	0										Carb. Slst.	10cm	125.7				Pulv.		113.1	114.1	
108.5		/	0										Coaly Sh.	30cm	128.1	10°	121.5	Banding Indist.	Blocky to Rbly.		114.1	116.4	
110.6		/	0.5								Sid					5°	123.0	Irreg.	Intact to Blocky		116.4	121.5	
113.7		/	0																Rbly.		121.5	123.5	
116.4		/	0																Blocky		123.5	125.6	
119.5		/	0																Pulv.		125.6	126.3	
122.5		/	0																Blocky		126.3	126.8	
125.6		/	0																Pulv.		126.8	128.4	
128.3		/	0.2																Rbly. to Blocky		128.4	131.7	
129.8		/	0.1	131.7	133.6		Blk.	S_4	Friable										Rbly. to Pulv.		131.7	133.0	
132.3		/	0																				
132.9		/	0	133.6	168.0	Coal	Blk.	R_1				L.5							Rbly. mild Shear		133.0	133.3	
				167.8	182.2	Coal	Blk.	S_5-R_1			Sid	L.5							Intact to Blocky		167.8	169.7	
																			Rbly. to Pulv.		169.7	171.4	

DATE July '78
LOGGED BY N.P.C., P.N., M.S.

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: X to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	X TO C.A.	INTERVAL FROM	INTERVAL TO	
32.9																			Blocky to Rbly.	40°	171.4	175.6	All highly sheared, probable fault zone.
																			Rbly. to Pulv.	15-40	175.6	176.4	"
																			Blocky to Rbly.		176.4	178.2	"
69.8		/																	Mostly Pulv.	20	178.2	180.7	"
72.5		/	0																Rbly.	30	180.7	182.2	"
75.6		/	0	182.2	184.7	Carb.Clst.	Br.Blk.	S_1	MASKED										Rbly.Pulv. Gouge	20	182.2 183.0	183.0 184.7	Minor rubbly Coal possible fault plane.
78.6		/	0	184.7	187.2	Coal	Blk.	S_5	BY			L.5							Rbly to Pulv.		184.7	187.2	All highly sheared, probable fault zone.
81.4		/	0	187.2	188.3	Carb.Clst.	Br.Blk.	S_1	TECTONIC										Gouge		187.2	188.3	"
84.7		/	0.3	188.3	198.9	Coal	Blk.	R_1	FEATURES			L.5	Coaly Clst.	0.3	197.5				Mostly Blocky	0-15	188.3	195.9	
86.8		/	0.6	198.9	199.3	Carb.Clst.	Br.Blk.	S_1	FOR THE										Mostly Pulv.		195.9	198.9	
92.6		/	0	199.3	206.7	Coal with Shaly Coal	Br.Blk. to Blk.	S_2-S_5	MOST PART			L.5							Pulv.		198.9	206.7	
96.0		/	0.3	206.7	207.2	Irst.	Yel.Gy.	R_1	Appears Granullar	V.Fine -Med.													Contacts sharp, contorted replaced ash?
03.6		/	0	207.2	210.1	Coaly Clst. to Carb.Clst.	Blk.Br.	S_2											Pulv., Sheared		207.2	210.1	
06.7		/	0	210.1	211.3	Silty Coal	Blk.	R_1	Friable			L.5							Sheared	90°	210.1	211.3	
09.1		/	0	211.3	211.9	Slightly Carb.Clst.	Med.Br.	S_5	Friable										Rbly.		211.3	211.9	
12.1		/	0	211.9	215.7	Coaly Clst to Silty Coal	Blk.	S_3	Friable										Sheared Pulv.		211.9	215.7	
15.2		/	0.7																				

DRILLHOLE DESCRIPTION

ROLL No 78-[illegible]

DATE July 78

LOGGED BY P.N.

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES															TECTONIC FEATURES			
				GEOLOGICAL INTERVAL		ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS			BEDDING			DESCRIPTION	∢ TO C.A.	INTERVAL	
				FROM	TO								TYPE	Thickness	AT	∢ to C.A.	AT	COMMENT			FROM	TO
217.9		/	0	215.7	216.5	Slightly Carb.	Med.Br.	S_2-S_3	Friable Pliable										Shrd. Pulv.		215.7	216.5
220.9		/	0	216.5	218.4	Coaly Clst to Silty Coal	Blk.	S_2-S_5	Inter-Mixed										Shrd.	10°	216.5	218.4
223.6		/	0.3	218.4	219.6	Carb.Clst.	Med.Br.	S_4-S_5	Friable				Coal	0.4	218.9				Shrd.		218.4	219.6
226.3		/	0.3	219.6	238.1	Coal	Blk.	S_5-R_1	Friable				Carb. Clst.	0.2	221.1	30°	229.1	Dist.	Rbly. Shrd.	5°	219.6	238.1
229.3		/	0										Sid.	0.1	233.0							
233.0		/	0.4										Clst.	0.1	233.1							
236.0		/	0										Carb. Clst.	15cm	234.2							
238.2		/	0.9										Irst.	0.4	235.7							
239.6		/	0	238.1	238.7	Carb.Clst.	Blk.	S_2-S_3	Pliable										Shrd.		238.1	238.7
242.6		/	0	238.7	242.7	Coal	Blk.	S_5-R_1					Carb. Clst.	0.2	239.2				Blocky Shrd.	5°-10°	241.1	242.7
245.6		/	0	242.7	243.9	Coaly Clst to Carb.Clst.	Blk.	S_3	Friable										Highly Shrd.		242.7	243.9
248.7		/	0	243.9	245.5	Coal	Blk.	R_1	Massive										Blocky		243.9	245.5
251.7		/	0	245.5	247.4	Coaly Clst	Blk	S_5	Friable										Shrd.		245.5	247.4
254.5		/	0	247.4	251.7	Coal	Blk.	R_1											Blocky		247.4	251.7
257.8		/	0	251.7	252.2	Silty Coal	Blk.	S_4	Friable										Shrd.	10°	251.7	252.2
260.9		/	0	252.2	267.7	Coal	Blk.	R_1	Massive				Irst.	25cm	258.8	50°	260.6	Ash Bed	Blocky	45-50°	252.2	267.7
263.9		/	0										Ash	4cm	260.6							

HOLE No.
DATE
LOGGED BY

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES																TECTONIC FEATURES			
				GEOLOGICAL INTERVAL		ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS			BEDDING			DESCRIPTION	% TO C.A.	INTERVAL	
				FROM	TO								TYPE	Thickness	AT	% to C.A.	AT	COMMENT			FROM	TO
267.0		/	2.3										Sid.	0.3	267.4							
270.0		/	0	267.7	268.4	Silty Coal	Blk.	S_1	Friable													
272.8		/	0	268.4	272.1	Coal	Blk.	R_1	Massive													
275.8		/	0	272.1	272.4	Coaly Clst	Blk.	S_5	Friable													
278.8		/	0	272.4	274.1	Coal	Blk.	R_1	Massive													
282.2		/	0	274.1	274.9	Coaly to Carb.Clst.	Blk.	S_1	Friable													
285.2		/	0	274.9	277.4	Coal	Blk.	R_1	Friable													
288.2		/	0	277.4	277.9	Coaly Clst.	Blk.	S_4	Friable													
291.2		/	0	277.9	286.5	Coal	Blk.	R_1	Massive										Blocky			
294.2		/	0	286.5	290.6	Carb.Clst. to Silty Coal	Med.Br.	S_5-R_1	Massive													
297.2		/	0	290.6	291.2	Coaly Clst	Blk.	S_4-S_5	Friable													
300.2		/	0	291.2	307.7	Coal	Blk.	R_1	Friable				Clst.	4cm	292.7							
303.2		/	0										Clst.	10cm	294.2							
306.2		/	0										Sid.	15cm	306.2							
309.2		/	0	307.7	308.5	Shaly Coal	Br.Blk.	S_5	Friable													
312.7		/	0	308.5	318.8	Coal	Blk.	R_1					Sid.	0.5	308.6	50	311.3	Irst.				
		/											Ash	10cm	310.2							

DDH 78-271

DATE July 1978

LOGGED BY

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO
315.5		x	0										Irst.	0.2m	311.3							
318.5		x	0										Ash Lam.	0.6m	317.4							
321.6		x	0										Ash	10m	318.5							
324.9		x	0	318.8	321.0	Silty Coal	Blk.	2-3, S4-S5	Friable				SID	10cm	320.7				Rubbly		318.8	321.0
328.0		x	0	321.0	339.7	Coal	Blk.	4, R1	Massive				Clst.	3cm	322.3	20°	322.3	Irregular Blocky		70°	321.0	339.7
330.7		x	0										Irst	4cm	323.5	10°	323.5	Irregular				
333.8		x	0.1										Silty Coal	0.3m	325.8	35°	327.0	Irregular				
336.8		x	0										Ash	2 cm	327.0							
340.2		x	0										Irst	0.2cm	332.9							
343.2		x	0										Silty Coal	0.3m	335.3							
346.3		x	0										Ash	8 cm	336.8							
349.3		x	0.7	339.7	340.2	Carb. Clst.	Dk.gy. to Blk.	3, S5	Massive							40°	339.8	Indistinct Blocky		50°	339.7	340.2
352.3		x	1.2	340.2	356.7	Coal	Blk.	4, R1	Massive				Clst.	8 cm	340.4	40°	342.0	Indistinct Blocky		80°	340.2	356.7
355.4		x	0										Clst.	4 cm	341.0							
358.4		x	0										Clst.	25 cm	342.0							
													Silty Coal	0.3m	350.5							
													Carb. Shale	0.2m	353.8							

HOLE No DDH 78-271
DATE July 1978
LOGGED BY

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO
				356.7	357.6	Carb. Clst.	med. gy.	3, S5	Massive							50°	356.9	Distinct	Blocky	50°	356.7	357.6
				357.6	358.4	Coal	Blk.	4, R1	Massive							50°	356.9	Distinct	Blocky	50°	357.6	358.4
				(End of Hole)																		

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER DDH-78-272

TYPE OF DRILLING NQ Diamond

	COORDINATES		ELEVATION	DATE
DIP -75°	LATITUDE	5,624,504 N	GROUND 917.7m	STARTED 27/07/78
AZIMUTH 090°	DEPARTURE	598,940 E	REFERENCE 917.7m	COMPLETED 29/07/78
	DRILLED BY	Coates Enterprises	LOGGED BY P.Northrop	GEOPHYSICAL LOGS BY B.Kleopfer
				TYPES

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	73°	81.9	80.5m
2			
3			
4			

DATE July 78
LOGGED BY P. Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO	
													Ash	3cm	47.1								
6.6		/		40.1	81.0	Clst.	Ol.Gy.	S_4-R_1	Massive				Ash	31cm	43.1				Blocky		40.1	81.1	
8.4		/	1.4	(End of Hole)									Ash	30cm	43.6				to Rbly.				Fractured at 60° to C.A.
9.6		/	0.2										Ash	5cm	62.8	65°	47.1	Ash Bed					Some joint planes at 5°-10° to C.A.
1.5		/	0.1										Ash	2cm	67.2	70°	58.1	Dist.					
4.5		/	0.1										Irst.	30cm	68.5	70°	67.2	Dist.					
7.5		/	0										Ash	1cm	70.0	65°	70.0	Dist.					
0.6		/	0.4										Ash	1cm	70.4	60°	70.4	Dist.					
3.6		/	0.5										Ash	1cm	70.6								
6.7		/	0																				
9.7		/	0.3																				
2.8		/	2.0																				
5.8		/	0.2																				
8.9		/	0.1																				
1.9		/	0																				
5.0		/	0.1																				
1.1		/	0																				

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER DDH-78-273

TYPE OF DRILLING NQ Diamond

COORDINATES UTM

DIP 60°

AZIMUTH 270°

LATITUDE 5,624,504 N

DEPARTURE 598,940 E

ELEVATION

GROUND 917.7m

REFERENCE 917.7m

DATE

STARTED 30/07/78

COMPLETED 3/08/78

DRILLED BY Coates Enterprises

LOGGED BY P.Northrop

GEOPHYSICAL LOGS BY B.Keapfer

TYPES Gamma,Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	65.9°	268.9	125.3m
2	66.0°	268.9	198.1m
3	69.5°	268.9	274.6m
4			

HOLE No 78-275
DATE July-Aug.
LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES																TECTONIC FEATURES			
				GEOLOGICAL INTERVAL		ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS			BEDDING			DESCRIPTION	∠ TO C.A.	INTERVAL	
				FROM	TO								TYPE	Thickness	AT	∠ to C.A.	AT	COMMENT			FROM	TO
33.5				38.0	258.4	Silty Clst.	Lt.Ol. Gy.	S_5-R_1	Fissile				Ash	10cm	42.1	30°	42.1	Irreg.	Blocky		38.0	258.4
35.4		/	1.8										Ash	10cm	49.9	40°	49.9	Indist.	Fracturing	50°-70°		
38.4		/	2.9										Ash	20cm	63.3	30°	63.3	Dist.	Jointing	55°		
41.5		/	2.8										Ash	20cm	131.5	40°	75.5	Dist.	Shearing		77.5	78.0
44.5		/	1.4										Ash	20cm	145.6	40°	114.6	Dist.	Mod. Sheared		88.2	89.2
53.6		/	0										Sid.	30cm	58.1	40°	123.6	Dist.	"		92.0	93.9
56.7		/	1.3										Ash	2cm	75.5	40°	133.6	Dist.	Sheared		103.4	105.7
59.7		/	0										Clst.	30cm	156.4	50°	135.6	Dist.	"		129.6	131,3
62.8		/	0.4										Ash	2cm	165.3	50°	145.6	Dist.	Rbly. and Sheared		139.8	142.7
67.7		/	0										Irst.	15cm	181.3	30°	156.5	Dist.	Rbly.		152.7	153.7
69.5		/	0.2										Calc. Clst.	40cm	185.9	80°	165.4	Ash Bed	Pulv. Sheared		197.2	198.3
75.0		/	0										Ash	20cm	189.8	85°	189.8	Ash Bed	Highly Sheared		254.1	258.2
78.0		/	1.2										Ash	10cm	191.2	85°	191.2	Ash Bed				
81.1		/	0.2										Calc.	10cm	224.0	85°	224.6	Dist.				
84.1		/	0										Irst.	20cm	258.2	85°	236.7	Dist.				
87.2		/	2.7										W/ Py.									
90.2		/	0																			

GEOLOGICAL DESCRIPTION

HOLE NO 78-275
DATE July-Aug.
LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∢ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∢ TO C.A.	INTERVAL FROM	INTERVAL TO
		/	0.5	258.4	275.2	Coal	Blk.	R_1	Massive			10-15	Ash	30cm	258.2	80°	258.3	Dist.	Blocky		258.4	267.7
		/	0										Clst.	10cm	260.5	75°	260.5	Clst.	Fracturing	80°		
		/	1.3										Ash	10cm	260.8	80°	267.4	Irst.	Rbly.to Pulv.		267.7	270.1
		/	0										Irst.	20cm	267.4				Blocky		270.1	275.2
		/	1.2										Clst.	10cm	270.1							
		/	0																			
		/	0.5																			
		/	0																			
		/	1.3																			
		/	0																			
		/	1.3																			
		/	0																			
		/	0.2																			
		/	0																			
		/	0.2																			
		/	0																			
		/	0.2																			

HOLE No 78-273

DATE July-Aug.

LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES																TECTONIC FEATURES				
				GEOLOGICAL INTERVAL		ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTER-ISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS			BEDDING			DESCRIP-TION	% TO C.A.	INTERVAL		
				FROM	TO								TYPE	Thick-ness	AT	% to C.A.	AT	COMMENT			FROM	TO	
		/	0																				
		/	0.3																				
		/	0																				
		/	0.1																				
		/	0.1																				
		/	0.1																				
		/	0.3																				
		/	0.9																				
		/	0.2																				
		/	0.1																				

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER DDH-78-277

TYPE OF DRILLING NQ Diamond

DIP -90°

AZIMUTH ———

COORDINATES UTM

LATITUDE 5,624,325 N

DEPARTURE 597,478 E

ELEVATION

GROUND 1047.1m

REFERENCE 1047.6m

DATE

STARTED 12/08/78

COMPLETED 16/08/78

DRILLED BY Coates Enterprises

LOGGED BY P.Northrop

GEOPHYSICAL LOGS BY B.Banks, Roke

TYPES Gamma,Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	84.0	311.9	148.1
2	87.0	327.9	85.3
3			
4			

DRILLING DATA — GEOLOGICAL DESCRIPTION

HOLE No 78-277
DATE Aug.78
LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: % to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO	
5.2 5.4		/	0	5.2	20.8	O.B. Basalt	Med. Yel.Br.	S_2-S_5	Unconsoli-dated				Irst.	0.2	5.2				Rbly.to Pulv.		5.2	20.8	Basalt fragments in sandy to silty matrix.
5.6 6.7		/	0 0.2			Flow													Severe Fracturing				
7.6 8.4		/	0 0	20.8	24.3	Silt.	Gr.Gy.	S_2	Unconsoli-dated										Pulv. Shrd.		20.8	24.3	Some solid fragments upt 10cm.
10.0 10.7		/	0.1 0																				
10.9 11.5		/	0 0.1	24.3	27.7	Sand	Gr.Gy.	S_2	Unconsoli-dated														Some solid fragments upt 25cm at 25.0m
11.9 12.4		/	0 0.3																				
13.1 14.6		/	0 0.6	27.7	37.4	Clayey Silt.	Gy. Gy.	S_2	Massive to Unconsoli-dated										Blocky		27.7	37.4	
15.8 17.1		/	0.7 0.6																Some Shrd. throughout				
17.7 19.7		/	0 0.5																				
21.0 24.1		/	0.1 1.5	37.4	104.2	Sand and boulders,	Blk. + Wh. to	S_2-S_5	Inter-Mixed		Ca				97.0								This unit consists of granodiorite and materials
25.0 28.0		/	0.3 0.2			W/some Silt	Gy.																of similar composition; probably decomposed
29.6 31.1		/	0.2 0.2																				Granodiorite slide material.
32.6 34.1		/	0 0.2	104.2	105.6	Carb. Slst.	Blk.	S_3	Massive										Blocky		104.2	105.6	Start of BR.
35.7 37.2		/	0.1 0.1	105.6	130.9	Slst.	Gy.Gr.	S_5	Massive				Carb. Clst.	0.1m	106.7				Blocky		105.6	130.9	
38.7 40.2		/	0.2 0.6							Coarse			Ss.	0.2	108.1								
41.8 43.3		/	0.1 0.2							Fine			Cgl.	0.2	108.9								
44.8		/	0.1																				

DRILLING DATA — GEOLOGICAL DESCRIPTION

HOLE NO 78-277
DATE Aug.78
LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: X to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	X TO C.A.	INTERVAL FROM	TO
6.3		/	0.1																			
7.9			0							Med.			Ss.	0.2	112.9							
8.8			0																			
9.4		/	0							Coarse			Cgl.	0.2	114.8							
9.9			0																			
0.9		/	0							Med.			Ss.	0.1	115.8							
2.4			0.1																			
3.9		/	0							Fine			Ss.	0.1	116.2							
5.5			0.1																			
7.0		/	0							Med.			Ss.	0.3	120.0							
8.5			0																			
0.0		/	0							Fine			Ss.	0.2	120.5							
1.6			0.1										Carb.									
3.1		/	0										Clst.	0.1	122.2	50°	122.2	Indist.				
4.6			0																			
6.1		/	0							Med.			Ss.	0.2	125.8							
7.3			0																			
8.6		/	0.4							Fine			Ss.	0.3	128.6							
9.8			0																			
1.0		/	0.5	130.9	131.3	Cgl.to Ss.	Gy.Gr.	S_5	Graded	Coarse to Fine						90°	130.9	Indist.	Blocky		130.9	131.3
2.2			0.5																			
3.2		/	0	131.3	133.0	Slst.	Gy.Gr.	S_5	Massive										Blocky		131.3	133.0
4.1			0.3				Lt.Gy.															
5.3		/	0.4	133.0	135.6	Cgl.	to Blk.	R_2	Massive	Coarse			Ss.	0.3	133.1	50°	135.6	Dist.	Intact.		133.0	135.6
6.5			0.3						Well Cement													
8.3		/	0.4						Calc.													
9.6			0																			
1.4		/	0.6	135.6	138.5	Slst.	Gy.Gr.	S_5	Massive										Blocky		135.6	138.5
2.3			0																			
4.4		/	0	138.5	139.6	Ss.	Gy.Gr.	S_5	Massive	Coarse									Blocky		138.5	139.6
6.0			1.0																			
7.5		/	0.3	139.6	140.3	Slst.	Gy.Gr.	S_5	Massive										Blocky		139.6	140.3
0.5		/	0.6																			

DATE Aug.78
LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO
93.6 96.5		/	1.8 0.6	140.3	143.2	Ss.	Gy.Gr.	S_5	Graded Massive	Coarse			Cgl.	0.3	141.0				Blocky		140.3	143.2
98.1 99.9		/	0.4 0.3	143.2	144.1	Slst.	Gy.Gr.	S_5	Massive										Blocky		143.2	144.1
02.4 04.5		/	0.3 0.3	144.1	147.5	Ss.	Gy.Gr.	S_5	Graded Massive	Med. to Coarse									Blocky		144.1	147.5
05.8 08.8		/	0.3 0.5	147.5	148.1	Slst.	Gy.Gr.	S_5	Massive										Blocky		147.5	148.1
11.9 14.9		/	0 0.6		END																	
18.0 21.0		/	0 0																			
24.1 27.1		/	0 0																			
30.1 33.2		/	0.1 0.1																			
36.2 39.3		/	0.2 0																			
42.2 45.1		/	0 0																			
48.1		/	0																			

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER DDH-78-278

TYPE OF DRILLING NQ Diamond

COORDINATES UTM

DIP -90°

AZIMUTH 270°

LATITUDE 5,623,883 N

DEPARTURE 598,371 E

ELEVATION

GROUND 982.6m

REFERENCE 982.9m

DATE

STARTED 14/08/78

COMPLETED 22/08/78

DRILLED BY Coates Enterprises

LOGGED BY M. Sanford
P. Northrop

GEOPHYSICAL LOGS BY B.Banks(Roke)

TYPES Gamma,Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	-85°	293.9	488.9
2			
3			
4			

DRILLING DATA — GEOLOGICAL DESCRIPTION

HOLE No 79-276
DATE Aug. 78
LOGGED BY M. Sanford

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
0.0	/			40.0	265.1	Mixed Clst.- Slst.	Lt.Ol. Gy.to Ol.Gy. with Med.Bl. Gy.to Dk.Gr. Gy.	S_5	Massive to roughly Interbedded				Ash	0.1	58.3	50°	58.3	Indist.	Mostly Blocky				Predominantly very fine grained grey mudstone.
46.0		/	0					S_2					Ash	.5cm	60.8	60°	60.8	Dist.	Fracturing often Parallel to				Roughly Interbedded.
47.5		/	0.1										Ash	0.1	64.6	55°	64.6	"	Sub-Parallel Bedding.				Slst. and Clst..
50.6		/	0										Ash	0.1	64.9				Facturing				Slst. are generally a Lt.Ol.Gy.colour,while t
53.6		/	0										Ash	0.1	69.9	55° 55°	65.7 69.5	Dist. Dist.					Clst.are generally from Med.Bl.Gy.to Dk.Gn.Gy.
56.7		/	0.1										Ash Ash	0.1 0.1	78.6 94.9	60° 45°	74.9 78.6	" "					
59.7		/	0										$CaCo_3$ rich layer	0.2	103.0								May be P.W.
62.8		/	0.1										Ss. Ash	0.1 0.2	101.6 164.1	55° 60°	89.4 96.1	Dist. "	Rbly. Intervals		58.9 71.6	59.8 72.2	Fracturing in this uni is predominantly paralle
65.8		/	0										Gyp. layer	0.2	197.5	55° 55°	101.6 109.9	" "	"		76.5 79.3	79.0 81.1	to sub-parallel to bedd-ing.
68.9		/	0.1													55° 50°	121.3 125.2	" "	"		90.0 115.5	93.6 118.2	Unit becomes much dark below 251.8
71.9		/	0													55° 55°	132.5 142.1	" "	"		119.0 123.4	119.8 124.0	
75.0		/	0.1													50° 45°	147.3 152.9	" "	"		128.4 135.4	128.9 136.4	
78.0		/	0													60° 60°	158.4 165.0	" "	"		140.3 159.7	144.3 161.1	
81.1		/	0.2													50° 45°	173.0 179.3	" "	"		172.9 184.4	176.8 186.7	
84.1		/	0													55° 60°	185.3 190.9	" "	"		191.0 196.7	191.6 197.8	
86.6		/	0.1													65° 60°	196.6 200.3	" Indist.	"		202.8 225.9	207.0 226.7	
89.6		/	0													60°	206.7	Dist.	"		228.9 238.1	229.4 239.1	

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-270
DATE Aug.78.
LOGGED BY M.Sanford

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
92.7			0													65°	212.3	Dist.	Rbly. Intervals		241.2	241.7	
95.7		/	0													50°	216.7	"			248.9	251.8	
98.8			0.6													70°	235.8	Indist.					
101.5		/	0													65°	239.9	Dist.					
104.5			0													60°	248.0	Dist.					
107.9		/	0													60°	254.6	"					
107.9			0																				
110.9		/	0										Ash	0.02	264.2	60°	264.2	"					
114.0			0																Blocky to Rbly.				Contacts gradational above and below.
115.5		/	1.3	265.1	265.7	Coaly Clst.	Dl.Blk. Blk.	R_1	Thickly Bedded														
117.7			0	265.7	272.0								Ash	0.05	267.2	75°	267.2	Indist.					
119.8		/	0			Coal	Blk.					5	"	0.1	267.6	55°	268.1	Dist.	Blocky				
122.8			0.2										"	0.01	268.1	55°	268.8	"					
125.9		/	0										"	0.05	268.8								
128.9			0										P.W.	0.1	269.1								
132.0		/	0																				
135.3			0													60°	272.7	Indist.					Contacts fairly sharp
138.4		/	0	272.0	273.0	Coaly Clst.	Br.Blk.	S_4	Massive										Rbly.				
141.4			0										Ash	0.02	274.1	50°	276.3	Dist. Mildly Contort.					
144.5		/	0	273.0	283.5	Coal	Blk.	R_1	Laminated		Rsn.		P.W.	0.1	278.9	55°	279.9		Blocky				
147.8			0										Clst.	0.2	276.3								
150.9		/	0										Clst.	0.1	276.6								
153.9			0										Coaly Clst.	0.2	280.9								
157.0		/	0.3										Ash	0.1	282.5								
160.3			0.5										Clst.	0.3	284.9								Top contact Grad. over 0.3m. Bottom contact sharp.
163.4		/	0	283.5	285.0	Shaly Coal	Br.Blk. to Dl.Gy.	S_3	Laminated Friable										Rbly.				
166.4		/	0.5							Fine to Coarse						45°	286.1	Dist.	Blocky to Intact				Poorly sorted.
				285.0	288.3	Slst. Ss.	Lt.Dl.	R_1	Interbedded							60°	287.0	"					
				288.3	289.0	Coal to Shaly coal	Blk.to Br.Blk.	S_5-R_1	Laminated Friable										Blocky				
				289.0	289.8	P.W.	Wh. to Med.Gy.	R_2											Intact				Minor Calcite contacts sharp at high angle to bedding.
				289.8	292.0	Coal	Blk.	R_1								60°	292.5	Dist.	Blocky				

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Aug.78

LOGGED BY M. Sanford

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∡ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∡ TO C.A.	INTERVAL FROM	INTERVAL TO	
168.9		/		292.9	294.5	Shaly Coal	Ol.Blk.	S_4				1	Carb. Clst.	0.3	293.8				Rbly.				
169.5 172.5		/	0.4 1.3	294.5	295.3	Coal	Blk.	R_1				5							Blocky				Contact gradational over 0.2m
175.9 178.6		/	0.3 0	295.3	301.2	Ss.-Slst.	Med.Gy. to Ol.Gy.	"	Interbedded	Med. for Ss.			Coaly Clst.	0.2	300.7	55° 60°	299.5 300.8	Dist. "	Intact to Blocky				Slightly Carbonaceous.
181.7 190.8		/	0.3 0	301.2	306.2	Coal	Blk.to Br.Blk.	"	Laminated Vitrain is Lensed			5	Shaly Coal	0.2	303.9	60	304.0	"	Blocky fracture parallel to bedding.				Contact gradational over 0.3m
196.3 202.7		/	0 0	306.2	307.3	Ss.	Med.Gy. to Lt. Bl.Gy.	"	Roughly Bedded to Massive	Med.									Intact				Lower contact sharp.
218.2 221.3		/	0 0.4	307.3	308.8	Ss.with minor Ss.	Lt. Bl.Gy.	S_5	Interbedded to Massive							55°	307.2	Dist.	Rbly.				
227.4 233.5 236.2		/	0 0.3	308.9	318.3	Coal	Blk.	R_1	Laminated			5	Ss. Ash	0.4 0.02	309.7 315.7	60° 65°	312.7 318.9	" "					Upper contact sharp, lower contact gradation over 0.3m
239.6 242.6		/	0.8 0										Carb. Clst.	0.3	318.3								
245.7 248.7		/	0	318.3	323.4	Carb. Slst.	Ol.Gy. to Ol.Blk.	R_1	Dist.Bedded to Laminated							55°	323.0	Dist.	Blocky				Some Med.-coarse sand present.
251.8 261.5		/	0.9m 0	323.4	324.2	Coal	Blk.	R_1	Laminated			5							Blocky to Rbly.				Contact gradational over 0.2m
264.0 288.3		/	2.5 0	324.2	334.0	Carb.Slst. to Slst. (slightly Carb.)	Ol.Gy. to Ol.Blk.	R_1	Distinctly Laminated				Shaly Coal	0.2	331.2	60° 55°	327.0 332.6	Dist. "	Blocky				Some Med. sand.
291.4 294.4		/	0.2 0.1	334.0	354.0	Coal	Blk.	R_1	Laminated			5-10	Coaly Clst. Ash	0.1 0.3	337.7 340.3	60° 60°	337.3 343.6	Indist. Dist.	Blocky to Rbly.				Upper contact gradational over o.5m
296.3 299.3		/	1.9 0.1										Coaly Clst. "	0.1 0.1	343.8 344.4				Fracturing is mostly				
355.4 358.4		/	0 0										Irst. Irst.	0.2 3cm	346.1 348.1				parallel to bedding.				
361.8 364.8		/	0 0										Ash Irst.	2cm 5cm	348.2 348.4	70°	348.2	Dist.					
367.9 370.6		/	0 0										Carb. Clst.	0.1	349.5								

GEOLOGICAL DESCRIPTION

DATE Aug.78
LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO
373.7		/	0	354.0	355.6	Carb. Clst.	Blk.to Dk.Gy.	S_4	Friable										Shrd.		354.2	355.6
376.7		/	0	355.6	360.0	Clst.	Lt. Ol.Gy.	S_5	Massive										Blocky to Intact.		355.6	356.9
379.8		/	0	360.0	361.7	Shaly Coal Carb. Shale	Blk.	R_1	Finely Interbedded										Blocky		356.9	361.2
382.8		/	0	361.7	364.7	Coal	Blk.	R_2	Interbedded				Irst.	0.1	361.4				Blocky		361.2	364.5
385.9		/	0										Clst.	0.3	361.8							
													Clst.	0.3	362.5							
													Carb. Clst.	0.2	364.1							
				364.7	365.7	Carb. Clst.	Ol.Gy. to Blk.	S_5	Massive				Irst.	0.2	365.5	70°	365.2	Dist.	Blocky		364.5	366.0
				365.7	368.2	Coal	Blk.	R_1	Friable				Carb. Clst.	0.3	366.2				Blocky		366.0	368.4
				368.2	369.6	Carb. Clst.	Ol.Blk. to Ol.Gy.	S_5	Friable				Irst.	0.2	367.1				Shrd.		368.4	369.7
				369.6	377.5	Coal	Blk.	R_1	Massive				Carb. Clst.	0.1	370.8				Disc.		369.7	377.9
													Clst. Sid.	0.3 2cm	373.7 374.1							
				377.5	378.5	Clst.	Ol.Gy.	S_4					Irst.	2cm	378.1				Shrd.		377.9	378.7
				378.5	379.8	Carb. Clst.	Blk.	S_5											Shrd.		378.7	379.5
				379.8	382.0	Coal	Blk.	R_1	Massive				Irst.	3cm	379.9				Blocky		379.5	382.5
				382.0	383.5	Clst.	Ol.Gy.	S_5	Massive										Rbly.		382.5	383.3

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-278
DATE Aug. 78
LOGGED BY P. Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∢ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∢ TO C.A.	INTERVAL FROM	INTERVAL TO	
388.9		/	0	383.5	387.0	Coal	Blk.	R_1	Friable				Irst.	0.1	383.5				Blocky		383.3	387.0	Sharp lower contact.
392.0		/	0										Carb. Clst.	0.2	386.5								
395.0		/	0	387.0	390.7	Clst.	Lt. Ol.Gy.	S_5	Massive										Blocky		387.0	390.5	Sharp lower contact.
398.1		/	0	390.7	400.4	Coal	Blk.	R_1	Friable				P.W. Sid.	0.2 0.1	393.1 394.9						390.5	400.4	
401.1		/	0										Sid. Sid.	0.1 0.3	399.1 399.6								
404.2		/	0	400.4	401.3	Carb. Clst.	Ol.Gy.	S_5	Massive							70°	401.3	Dist.	Blocky		400.4	401.3	Sharp upper contact.
407.2		/	0.1	401.3	407.5	Clst.	Lt. Ol.Gy.	S_5	Massive				Ss.	0.4	401.8				Blocky		401.3	407.7	
410.3		/	0										Carb. Clst.	0.3	402.6								
413.3		/	0	407.5	410.7	Coal	Blk.	R_1	Friable				Sid. Ash	0.2 0.1	409.3 410.2				Blocky		407.7	410.9	
416.4		/	0	410.7	412.1	Carb. Clst.	Med.Gy.	S_5	Interbedded										Blocky		410.9	411.9	
419.4		/	0	412.1	416.5	Coal	Blk.	R_1					Carb. Clst. Coaly Clst.	0.1 0.1	414.2 416.6				Blocky		411.9	417.1	
422.5		/	0	416.5	418.0	Clst.	Ol.Gy.	S_5											Blocky, some Shrd.		417.1	417.9	
425.5		/	0	418.0	420.8	Shaly Coal	Blk.	R_1	Thinly Interbedded				Clst.	0.3	418.4						417.9	420.6	
													Ash Ash	2cm 1cm	419.4 419.7								
													Clst.	0.2	420.0								
				420.8	426.0	Carb. Clst.	Blk. to Ol.Gy.	S_5	Thinly Interbedded				Clst. Clst.	0.3 0.3	421.3 423.1						420.6	425.5	

DATE Aug.78
LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING X to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	X TO C.A.	INTERVAL FROM	INTERVAL TO	
428.5		/	0	425.0	427.3	Coal	Blk.	R_1	Friable				Irst.	12cm	426.9				Blocky		425.5	427.2	
431.6		/	0	427.3	428,4	Clst.	Ol.Gy.	S_5	Massive										Blocky Shrd.		427.2 427.8	427.8 428.5	
434.6		/	0	428.4	431.5	Coaly Clst.	Blk.	"	Finely Interbedded				Ash Clst.	0.1 0.2	430.0 431.1	50°	431.1	Dist.	Blocky		428.5	431.7	
437.7		/	0.2	431.5	442.4	Clst.	Lt. Ol.Gy.	"	Massive				Sid. Ss.	0.1 0.3	431.7 432.1				Blocky		431.7	442.3	
440.7		/	0.1										Carb. Clst. Ash	0.2 0.2	435.6 442.0								
443.8		/	0	442.4	445.8	Coal	Blk.	R_1	Friable							65°	444.7	Dist.	Blocky		442.3	446.0	
446.8		/	0	445.8	450.0	Clst.	Lt. Ol.Gy.	S_5	Interbedded				Ss. Ss.	35cm 0.3	448.0 448.5	60°	449.9	Dist.	Blocky		446.0	450.3	
449.9		/	0.2										Irst. Ss.	0.2 0.2	448.8 449.0								
452.9		/	0										Carb. Clst. Coal	0.4 15cm	449.3 449.9								
456.0		/	0.1	450.0	455.2	Coal	Blk.	R_1											Blocky		450.3	456.1	Sharp lower contact.
459.0		/	0	455.2	456.4	Clst.to Coaly Clst	Ol.Gy. to Blk.	S_2-S_4	Gradational										Blocky		456.1	456.5	
462.1		/	0	456.4	459.8	Coal	Blk.	R_1					Clst. Ash	0.1 0.2	457.5 457.8				Blocky		456.5	459.9	
465.1		/	0	459.8	460.4	Carb. Clst.	Ol.Gy. to Blk.	S_5	Gradational										Blocky		459.9	460.7	
468.2		/	0	460.4	462.0	Coal	Blk.	R_1											Blocky to Rbly.		460.7	462.2	
				462.0	463.0	Coaly Clst.	Blk.	S_5	Finely Interbedded										Blocky		462.2	463.4	
				463.0	466.4	Clst.	Ol.Gy.	S_5	Massive										Blocky		463.4	466.3	

GEOLOGICAL DESCRIPTION

DATE Aug.78

LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES % TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
471.2		/	0	466.4	467.9	Coal	Blk.	S_5-R_1	Massive				Ash	0.1	466.6				Blocky		466.3	468.2	
474.3		/	0	467.9	468.5	Clst.	Ol.Gy.	S_5	Massive										Blocky		468.2	468.8	
477.3		/	0	468.5	470.7	Coal	Blk.	R_1	Friable										Blocky		468.8	471.2	
480.4		/	0	470.7	471.8	Slightly Carb.Clst.	Ol.Gy.	S_5	Thinly Interbedded										Blocky		471.2	471.8	
483.4		/	0.2	471.8	477.3	Coal	Blk.	R_1	Friable				Irst.	0.2	471.9				Blocky		471.8	477.4	Sharp lower contact.
486.5		/	0	477.3	483.6	Sandy Slst.	Lt. Ol.Gy.	S_5	Interbedded				Ss. Ss.	0.2 0.3	480.0 481.4				Blocky		477.4	483.6	
489.5		/	0	483.6	484.5	Fine gr. Ss.	Lt. Ol.Gy.	"	Massive										Blocky		483.6	484.5	
				484.5	486.4	Clst.	Lt. Ol.Gy.	"	Massive				P.W.	0.3	485.1						484.5	486.4	
				486.4	489.5	Carb. Clst.	Ol.Gy.	"	Laminated				P.W.	0.3	486.9								
					END								Sid.	0.1	488.0								

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER DDH-78-279

TYPE OF DRILLING Diamond NQ

COORDINATES UTM

DIP -75°

AZIMUTH 270°

LATITUDE 5,624,183 N

DEPARTURE 598,045 E

ELEVATION

GROUND 1018.0m

REFERENCE 1018.3m

DATE

STARTED 17/08/78

COMPLETED 27/08/78

DRILLED BY Coates Enterprises

LOGGED BY P. Northrop
G. Green

GEOPHYSICAL LOGS BY B. Banks (Roke)

TYPES Density, Gamma Ray

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	74.5°	281.9	405.4m
2	76.1°	276.9	326.1m
3	75.7°	274.9	256.0m
4	74.5°	273.9	179.8m

DRILLING DATA | GEOLOGICAL DESCRIPTION

DATE Aug.78
LOGGED BY P.Northro

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES % TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
50.9		/	0	40.3	50.5	Carb. to Coaly Clst.	Blk.	S_2	Pliable														
52.7		/	0	50.5	51.0	Clst.	Ol.Gy.	S_3	Massive														
53.6		/	0.3	51.0	53.6	Coal	Blk.	R_1	Friable										Blocky		51.0	52.4	Contact sharp.
56.7		/	0																Pulv.		52.4	53.6	
59.9		/	0	53.6	55.0	Carb. Clst.	Blk.to Ol.Gy.	S_5	Friable										Shrd.		53.6	55.0	Contact sharp.
62.2		/	0	55.0	56.0	Clst.	Ol.Gy.	"	"										"		55.0	56.0	
63.7		/	0	56.0	56.8	Carb. Clst.	Blk.	"	"										"		56.0	56.8	
64.3		/	0.2	56.8	58.5	Clst.	Ol.Gy.	"	"										"		56.8	58.5	
65.7		/	0	58.5	60.7	Coal	Blk.	R_1	"							20°	59.1	Banding	some Shrd.		58.5	60.7	
67.1		/	0	60.7	61.7	Carb. to Coaly Clst.	Blk.	S_4	"										Shrd.		60.7	61.7	
69.2		/	0.1	61.7	63.8	Coal	Blk.	R_1	"										Rbly. Intact		61.7 62.2	62.2 62.7	
72.2		/	0.1																Pulv. to Rbly.		62.7	63.8	
75.3		/	0.2	63.8	66.7	P.W.	Blk.	R_2	Massive		Fe Co_3		Clst.	0.1	64.7				Blocky		63.8	66.7	Some calcite veinlets up to 1cm throughout.
				66.7	67.1	Coal	Blk.	R_1	Friable										Rbly.		66.7	67.1	
				67.1	69.3	Clst.	Ol.Gy.	S_4	Pliable				Carb. Clst.	0.2	67.5				Shrd.		67.1	69.3	Contact sharp.
				69.3	72.6	Clst.	Gr.Gy.	S_5	Massive										Blocky		69.3	72.6	

DATE Aug.78

LOGGED BY P.Northro

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∡ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∡ TO C.A.	INTERVAL FROM	INTERVAL TO
78.3		/	0	72.6	76.0		Ol.Gy.	S_4	Massive										Shrd.		72.6	76.0
81.4		/	0.1	76.0	78.7		Gn.Gy.	S_5	Massive										Blocky		76.0	78.7
82.9		/	0	78.7	93.7		Ol.Gy.	S_2	Friable										Pulv. Shrd.	60° 70°	78.7	89.6
86.0		/	0						and Pliable				Coal	0.2	85.9				Mod. Shrd.		89.6	93.7
89.0 91.4		/	0.1 0	93.7	103.0		Blk.	S_2-S_4	Friable				Irst.	0.2	97.4				Shrd. Pulv.		93.7	103.0
93.6 96.6		/	0 0										Irst.	0.1	100.7							
99.7 102.7		/	0 0.2	103.0	116.0								Carb. Clst.	0.1	103.2				Mod. Shrd.		103.0	116.0
104.9 107.9		/	0 0										Ss.	0.3	111.2				Blocky			
110.9 114.0		/	0 0	116.0	117.0		Ol.Gy.	S_5	Poorly Cemented	Med.									Blocky		116.0	117.0
117.0		/	0	117.0	122.2		Ol.Gy.	S_2-S_4	Massive	Fine									Pulv. Blocky		117.0 118.0	118.0 122.2
120.7		/	0.3	122.2	124.1		Gy.Blk.	S_2-S_4	Highly Fractural	Fine								Contort.	Rbly.		122.2	124.1
124.1		/	0.4	124.1	125.5		Ol.Gy.	S_2-S_4	Massive	Fine									Broken			
126.5		/	0	125.5	126.6		Gy.Blk.	S_2-R_1	Coaly	Mixed									Broken			
129.5		/	0	126.6	142.3		Gy.Blk. to Ol.Gy.	S_2-S_4	Interbedded Mixed	Fine to Coarse			Ss. Fine	1.5	128.0				Rbly. to Sound			
132.7			0				Gy.Blk.						Carb. Sh.	1.0	132.7				Rbly. to Blocky			
135.9			0				Gy.	S_3-S_4	Tuffaceous	Fine to Coarse			Fine Ss.	1.4	133.7				Sound to Blocky			
139.1			0																Jointed	70°	129.5	132.7

DRILLING DATA — GEOLOGICAL DESCRIPTION

HOLE NO 78-2
DATE Aug. 78
LOGGED BY P. Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∠ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
142.3		/	0				Gy.Blk.	S_2-S_4					Carb. Sh.	.9	135.0				Rbly.				
144.5		/	.2				Gy.Blk.	S_2-S_4		Fine			Carb. Clst.	6.4	135.9				Rbly.				
145.4		/	0	142.3	145.4	Coal	Blk.	R_1	Shaly			1%				20°	144.7	Ash Contort.	Rbly. to Pulv.				
148.5		/	0	145.4	150.8	Carb. Slst.	Gy.Blk.	S_4	Carbonaceous	Fine to Silty						40° 50°	145.4	Contort	Rbly.				
151.8		/	0	150.8	156.1	Ss. Slst.	Bl.Gy.	R_1	Graded Beds	Fine to Sandy			Irst.	.1	156.1				Pulv.		150.5	150.8	Fault gouge
154.9		/	0										Carb. Sh.	.5	153.4				Blocky to Sound				
157.3		/	0	156.1	166.8	Coal	Blk.	R_2	Friable				P.W.	.2	156.6								
160.3		/	0										P.W.	.2	156.9								
163.1		/	0										P.W.	.1	158.8	60°	159.4	Thin Lenses					
165.8		/	2.5				Dk.Gy.	S_4		Fine			Carb. Sh.	.4	159.6				Rbly. to Pulv.		159.6	160.7	
168.9		/	0	166.8	168.9	Clst.	Ol.Gy.	S_2	Massive										Pulv.				Soft and contorted.
171.9		/	2.8	168.9	186.7	Coal	Blk.	R_1	Massive			5%				25°	172.6	Thin Lenses					Good blocky vitrain 0.1 m thick.
172.8		/	.1										P.W.	.1	168.9	70°	182.7	Disc.					
173.1		/	.2				Gy.Gr.	S_4					Clst.	3.8	173.1	75°	185.9	Dist.thin Lenses	Rbly. to Pulv.				Lots of core loss.
175.9		/	2.4				Ol.Gy.	S_4					Clst.	.7	179.0				Rbly. to Pulv.				
176.5		/	0	186.7	188.1	Carb. Sh. + Clst.	Gy.Gr.	S_4	Sandy										Pulv.		188.1	186.7	

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Aug.78
LOGGED BY P.Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
179.7		/	.2	188.1	194.1	Slst.+ Ss. Mixed	Bl.Gy.	S_5-R_1	Graded	Fine to Coarse	$CaCo_3$								Blocky				Minor $CaCo_3$ infilling 189.6-190.1
182.9		/	.6	194.1	198.1	Carb. Slst. + Carb.Slt.	Gy. to Blk.	S_5	Graded beds							30°	194.6	Indist.					Slickensided parallel to Ca.
185.5		/	0	198.1	203.4	Slst. + Ss.	Bl.Gy.	S_5	Graded	Fine to Coarse	$CaCo_3$		Ss.	.8	202.0				Blocky				Minor $CaCo_3$ from 202.0-202.8
188.1		/	0	203.4	205.7	Carb. Slst.	Gy.Blk.	S_5	Graded				P.W.	.3	205.2	65 70°	204.9	Dist.	Blocky to Disc.				
191.1		/	0	205.7	231.0	Slst. + Carb.Slst.	Ol.Gy. to Gy.Blk.	S_5	Graded										Blocky				
194.2		/	0				Blk.						Coal	.4	210.8				Rbly.				
197.2		/	.2										P.W.	.5	223.6								
200.3		/	0				Gy.	R_1		Coarse	$CaCo_3$		Ss.	.6	209.2								$CaCo_3$ veinlets.
203.4		/	0													60° 70°	215.6	Dist.					
206.7		/	0				Gy.	R_1		Coarse	$CaCo_3$		Ss.	.4	220.7				Blocky				$CaCo_3$ veinlets
209.8		/	0																Rbly.		221.2	221.3	
212.1		/	0				Ol.Gy.	S_4		Fine			Ss.						Rbly.to Pulv.		224.3	227.3	
215.2		/	.2										Coal	.2	230.5				Pulv.				
218.2		/	0	231.0	291.0	Coal	Gy.Blk.	R_1	Graded Woody			1-2				70°	234.0	Dist.	Rbly.to Pulv.		231.0	291.0	
221.3		/	0										P.W.	.2	237.3	70°	236.0	Dist.					
224.3		/	0				Lt.Br.	S_5		Fine			Ash	.1	238.1								
227.4		/	1.6				Lt.Gy.	S_4					Sh.	.2	239.8								

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Aug.78
LOGGED BY G. Green

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∢ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∢ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
230.4		/	0				Wh.	R_1	Friable	Med. Coarse	$FeCo_3$		Ash	.3	241.0	80°	243.0	Dist.					* Iron Carbonate.
233.5		/	.5				Blk.	R_1	Brecciated	Coarse			Brec. Coal	.3	245.8	80°	245.0	Dist.					Brecciated clay and P.W. in Coal.
236.5		/	0				Gy.Blk.	S_4	Friable				Shaly Coal	1.2	247.8				Rbly. to Pulv.		247.8	249.2	
239.6		/	0										"	.5	251.1				"		251.1	251.6	
242.6		/	0										"	.7	251.8	30°	253.0	Dist.	"		251.8	252.5	
245.7		/	0				Or.	S_4	Friable	Fine			Ash	.1	254.5								
249.0		/	0				Gy.Blk.	S_5-R_1	Friable				Coaly Sh.	.6	255.1				Rbly. to Pulv.shrd.		255.1	255.7	
252.1		/	0				Gy.Blk.	S_4	Friable				Coaly Sh.	2.6	257.0				Rbly. to Pulv.		257.0	259.6	
255.1		/	0				Gy.Blk.	R_2					P.W.	.4	259.7								
258.2		/	0				Gy.Blk.	S_5-R_1					Coaly Sh.	.3	260.5				Rbly.		260.5	260.8	
261.2		/	0				Gy.Blk.	S_5-R_1					Coaly Sh.	.6	261.2	30°	261.0	Dist.	Rbly. to Pulv.		261.2	261.8	
264.3		/	0										P.W.	.1	262.4								
267.3		/	0				Gy.Blk.	S_4					Coaly Sh.	.3	262.5				Rbly. to Pulv.				
270.4		/	0				Gy,Blk.	S_4					Coaly Sh.	.2	263.4				Pulv.				
273.4		/	0				Gy.	S_4	Friable				Carb. Sh.	3.5	265.3	40°	268.8	Dist.	"		265.3	268.8	Highly Pulv.
275.5		/	0				Gy.	S_4	Friable				Carb. Sh.	.2	270.8				"				
278.8		/	0																				

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Aug. 78
LOGGED BY G. Green

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
281.9		/	0				Gy.Blk.	S_4-S_5	Friable				Shaly Coal	3.6	271.0				Rbly to Pulv.		271.0	274.6	
285.0		/	0				Gy.Blk.	"	Friable				Carb. Sh.	3.8	280.2	70°	282.0	Dist.	Rbly.		280.2	284.0	
288.0		/	0				Gy.	"	Fractured				Clst.	.5	284.0				Rbly.				
291.1		/	0				Gy.	"		Coarse			Ss.	.5	284.5				Rbly				
292.9		/	0				Gy. Blk.Gy.	S_4	Highly Fractural				Carb. Sh.	6.5	284.5				Rbly. to Pulv.		284.5	291.0	
296.0		/	0	291.0	331.0	Ss. Cg.+Clst.	Gy. Bl.Gy.	R_1	Graded	Fine to Coarse	$CaCo_3$					35°	320.0	Dist.	Blocky Sound		291.0	331.8	$CaCo_3$ cement.
299.3		/	0				Gy.	S_4	Graded	Coarse			Ss.	1.3	292.7				Blocky				
302.5		/	0				Gy.	S_4	Graded	"			Peb. Cg.	.6	294.0				Blocky				
305.7		/	0				Gy.	S_5	Fissel				Slst.	1.7	295.6				Blocky				
308.8		/	0				Gy.	S_4	Crumbly	Coarse			Ss.	.2	297.3								
311.8		/	0				Gy.	S_4					Slst.	1.4	297.5				Blocky				
315.2		/	0				Dk. Ol.Gy.	S_3-S_4					Slst.	.3	299.3								
318.3		/	0				Lt. Br.Gy.	S_5-R_1		Coarse			Irst.	.4	299.6				Sound				
321.4		/	0				Lt.Gy.	R_1-R_2	Coarse Peb. Cobble	"	$CaCo_3$		Cg.	3.0	300.8				Sound				Sound.
324.1		/	0					R_1	Occassionally Sandy				Slst.	1.5	304.0				Sound to Blocky				
326.4		/	1.7				Lt.Gy.	S_4		Coarse	$CaCo_3$		Ss.	4.8	305.5				Blocky to Rbly.				
328.6		/	0				Lt.Gy.	S_4-R_1					Slst.	5.0	310.3				Blocky to Sound				

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Aug.78

LOGGED BY P.Northrop & G. Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
331.0		/	0				Lt.Gy.	R_1		Peb.to Coarse Ss.	Ca Co_3		Peb. Cg.	2.7	315.3				Sound				
334.2		/	0				Lt. Ol.Gy.	R_1	Fissle				Slst.	3.7	318.0				Sound				
337.4		/	0				Lt.Gy.	S_4		Coarse			Ss.	.7	321.7				Blocky				Clay cement.
341.7		/	0				Lt. Ol.Gy.	S_4	Fissle				Slst.	3.2	322.4				Blocky				
344.7		/	0				Lt.Gy.	S_3-S_4		Coarse			Ss.	.3	325.6				Blocky				Poorly cemented with clay.
347.8		/	0				Lt. Ol.Gy.	S_3					Slst.	5.1	325.9				Blocky				Slightly Carbonaceous.
350.8		/	0	331.0	334.0	Slst.	Ol.Gy.	S_5											Blocky to Rbly.				
353.9		/	1.5	334.0	334.6	Carb.Slst.	Blk.	S_5								20°	334.4	Distinct	Pulv. Blocky		334.0 334.4	334.4 334.6	
356.0		/	0	334.6	336.2	Slst.	Ol.Gy.	S_5											Shrd.		334.6	336.2	
359.4		/	0	336.2	336.5	Marl.	Lt.Gy.	R_1											Intact.		336.2	336.5	
362.4		/	0	336.5	336.8	P.W.	Med.Gy.	R_1											Blocky		336.2	336.8	
				336.8	341.6	Carb.Slst.	Ol.Gy. to Blk.	S_5								5° – 50°	341.0 341.6	Variable	Shrd.		336.8	341.6	
				341.6	345.3	Slst.	Lt. Ol.Gy.	S_5											Blocky		341.6	345.3	
				345.3	347.9	Slightly Carb.Slst.	Ol.Gy.	S_5					Irst. Irst.	0.1 .5	345.3 347.6	80° 0°	347.9 349.0- 350.9	Distinct Distinct	Mod.Shrd. Rbly.		345.3	347.9	Sharp lower contact at 25° at 350.9
				347.9	350.9	Carb.Slst.	Ol.Gy. to Blk.	S_5	Lam.				Ss.	0.2	351.2				Shrd. Rbly.		342.9	350.9	
				350.9	360.6	Slst.	Lt. Ol.Gy.	S_5					Ss. Ss.	0.3 0.3	357.4 358.0				Blocky		350.9	360.6	
													Carb. Slst. Irst.	0.1 0.3	360.2 353.9	50°	360.5	Distinct					

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Aug.78
LOGGED BY P.N.

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
365.8		/	0.4	360.6	363.0	Coal	Blk.	R_1					Carb. Shaly	0.3	361.1				Some Shrd. Blocky		360.6	363.0	Sharp lower contact.
367.9		/	0	363.0	372.9	Slst. with slightly Carb. Lam.	Ol.Gy.	S_5	Lam.				Irst. Irst.	.5cm 0.1	365.4 366.9	30° 20°	367.7 371.4	Dist. Dist.	Blocky		363.0	372.9	
370.9		/	0										Irst.	0.4	368.6	30°	372,4	Dist.					
374.3		/	0.2	372.9	373.7	Carb. Slst.	Blk.	S_5											Shrd.	5°	372.9	373.7	
377.3		/	0.5	373.7	377.3	Slst.	Ol.Gy.	"	Lam.							80°	375.8	Indist.	Blocky		373.7	377.3	Carbonaceous Lam.
378.9		/	0	377.3	378.3	Carb. Slst.	Blk.	"											Blocky		377.3	378.3	
381.9		/	0	378.3	383.0	Ss.	Lt. Ol.Gy.	"		Fine to Med.			Slst. Irst.	0.3 0.2	378.3 379.2	50° 30°	382.4 384.2	Indist. Dist.	Blocky		378.3	383.0	
383.7		/	0.2										Slst.	0.3	382.3								
387.0		/	0.3	383.3	384.2	Slst.	Ol.Gy.	S_5					Carb. Slst.	0.1	384.2	30°	384.2	Dist.	Blocky		383.0	384.2	
389.2		/	0	384.2	386.4	Ss.	Lt. Ol.Gy.	"		Med.									Blocky		384.2	386.4	
392.3		/	0.3	386.4	388.4	Slst.	Lt. Ol.Gy.	"					Irst.	0.2	386.8	35°	387.6	Dist.	Blocky		386.4	388.4	
395.3		/	1.2	388.4	389.0	Marl.	Lt. Ol.Gy.	R_1											Blocky		388.4	389.0	
398.1		/	0.5	389.0	389.4	Carb. Slst.	Blk.	S_3											Shrd. Pulv.		389.0	389.4	
401.1		/	0	389.4	394.7	Slst.	Lt. Ol.Gy.	S_5											Blocky		389.4	394.7	
				394.7	395.3	Marl.	Lt. Ol.Gy.	R_1											Blocky		394.7	395.3	
				395.3	399.5	Slst.	Lt. Ol.Gy.	S_5					Coal	0.1	398.6	50°	398.2	Dist.	Blocky		395.3	399.5	

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Aug.78
LOGGED BY P.N.

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO
403.9		/	0	399.5	402.1	Ss.	Gr.Gy.	S_5	Interbedded	Fine to Med.									Blocky		399.5	402.1
406.9		/	0	402.1	404.8	Slst.	Lt. Ol.Gy.	S_5	Laminated							40°	402.3	Dist.	Blocky		402.1	404.8
				404.8	405.3	Marl.	Lt. Ol.Gy.	R_1											Intact		404.8	405.3
				405.3	406.9	Slightly Carb.Slst.	Lt. Ol.Gy.	S_5	Interbedded										Blocky		405.3	406.9
					END																	

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER 78-280

TYPE OF DRILLING NQ

COORDINATES UTM

DIP 70°

LATITUDE 5,623,880 N

AZIMUTH 090°

DEPARTURE 598,437 E

ELEVATION

GROUND 978.4m

REFERENCE 979.0m

DATE

STARTED Aug.23

COMPLETED Sept.2

DRILLED BY Coates Enterprises

LOGGED BY P.Northrup
N.P.Crocker
A.W.Penner

GEOPHYSICAL LOGS BY Roke

TYPES Gamma + Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	70.5°	90.0	323.4
2	71.5°	87.9	204.5
3			
4			

DRILLING DATA

GEOLOGICAL DESCRIPTION

HOLE No. 78-280

DATE Aug.78

LOGGED BY P. Northrop

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
43.9 47.2		/	1.5		51.3	Clayey Slst.	Ol.Gy.	S_5	Massive				Ss.	0.2	51.1				Blocky			51.3	Biotite flakes in Ss. at 51.1
48.8 51.8		/	0.1 0.1	51.3	51.9	Slst.	Lt. Ol.Gy.	S_5											Blocky		51.3	51.9	Biotite flakes.
54.9 57.9 61.0		/	0 0.1 0	51.9	381.1	Clayey Slst.	Ol.Gy.	S_5	Massive				Ash	0.1	59.6	30°	54.6	Dist.	Blocky		51.9		
64.0 82.6		/	0 0										Ash	0.2	66.3				to Rbly. with moderate Shrd. throughout				
85.3 87.8		/	0 0.1										Ash	5cm	68.8	40°	68.8	Indist.					
90.8 92.4		/	0.2 0.1										Ash	5cm	72.8								
98.8 101.8 107.9		/	0 0.1 0										Ss.	0.2	82.6								
110.9 154.2		/	0.2 0										Ss. Lam.	0.1	87.1	30°	87.1	Indist.					
156.7 159.7		/	0 0.1										Ash	0.1	91.8								
172.5 175.6		/	0 0.1										Irst. Irst.	0.1 0.1	93.8 119.5								
177.1 180.1		/	0 0.3										Ash Ash	0.1 3cm	126.3 142.7	30° 30°	126.3 142.7	Indist. Dist.					
190.8 193.9		/	0 0.7										Clst. Ash	0.1 0.1	173.1 187.6	35°	187.6	Dist.					
196.0 199.0		/	0 0.1										Ash Ash	0.1 0.3	201.7 202.4								
202.4 205.4		/	0 0.1										Ash Irst.	3cm 12cm	217.5 256.1								
230.1 233.5		/	0 0.2										Irst. Ash	0.1 10cm	270.9 284.0	50° 55°	285.7 305.5	Dist. Dist.					
244.8 248.1		/	0 0.2										Cal. Band	7cm	312.8	50°	312.8	upper indist. lower dist.					
251.2 254.2		/	0 0.1										Irst. Ash	17cm 7cm	314.7 327.4								

DATE Aug.78
LOGGED BY N.P.C.+ A.W.P.

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
254.2		/	0			Clayey Slst.							Irst.	4cm	329.3	40°	334.9	Dist.					Irst. prob. Ash with Sid. Ppt. in it?
257.3													Irst.	3cm	342.1	60°	338.4	Indist.					
257.3		/	0.1										Irst.	0.1	343.3	55°	343.3	Dist.					
260.3													Irst.	7cm	356.0	40°	350.0	Dist.					
260.3		/	0										Slst.	1.2m	357.3	50°	358.5	Dist.					
263.3															358.5								
263.3		/	0										Slst.	0.2m	359.2								Slst. contact at 359.2m is gradational.
266.4															359.4								
266.4		/	0												363.9				Frag. to crushed W. Tr. of gouge		363.0	364.7	Fine white noncalcareou powder in on minor sheared surface at 363.
269.4		/	0	381.1	369.0	Clst. matrix with many Ca. stringer	Med. Lt. Gy.	R_1	Many Ca. stringers Gen. Fol. the	Fine						60°	369.0	Dist.	Blocky with a few minor shears.		364.7	368.5	
272.5																55°	375.0	Dist.					
272.5		/	0	369.0	400.0	Clst. with minor Slst. Ash beds	Gen. Med Gy. ranging from Lt Gy. to Dk. Gy.	S_3-R_1	bedding plane Interbedded minor Slst. and Ash beds contacts are usually sharp to slightly gradational. Fractures are commonly parallel to the bedding.				Ash	0.03m	369.2	50°	380.5	Indist.	Intact		368.5	369.0	
275.5																50°	385.0	Indist.					
275.5		/	0										Ash	0.01m	370.5	60°	390.0	Indist.	Fragmented to Crushed.		369.0	371.7	
278.6																60°	395.2	Dist.					
278.6		/	0										Slst.	0.4m	371.8				Intact		371.7	372.1	Slst. 371.8-372.0 grading into calcareous Slst. 372.0-372.2m. (many Calcite stringers)
281.6															372.2								
281.6		/	0.2										Ash	0.05m	379.3				Blocky with some crushing.		372.1	377.8	
284.7																							
284.7		/	0										Ash	0.2m	380.5				Gen. Frag.+ crushed W. some Blocky core.		377.8	380.9	
288.0															382.0								
288.0		/	0										Slst.	0.4m	382.4				Blocky.		380.9	383.2	
291.4															384.3								
291.4		/	0										Slst.	0.2m	384.5				Gen. Frag. with some blocky core		383.2	391.8	
294.4													Slst.	0.05	386.6				intact core at 384.4-384.6				
297.5		/	0.2										Slst.	0.1	389.4								
297.5													Slst.	0.25	392.5				Gen. Intact with some Blocky.		391.8	394.5	
300.5		/	0.1										Slst.	0.2	394.8								
300.5													Slst.	0.1	394.8				Gen. Blocky with some crushing.		394.5	400.0	
303.6		/	0										Ash	0.1	395.2								
303.6		/	0										Slst.	0.1	397.3								
306.6																							

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Aug.78
LOGGED BY A.W.P.

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
LITHOLOGIC FEATURES																							
306.6 309.7		/	0										S1st.	0.3m	398.2 to 398.5								
309.7 312.7		/	0																				
312.7 315.8		/	0																				
315.8 318.8		/	0																				
318.8 321.9		/	0																				
321.9 324.9		/	0																				
324.9 328.0		/	0																				
328.0 331.3		/	0.2																				
331.3 334.1		/	0.4																				
334.1 337.1		/	0																				
337.1 340.2		/	0																				
340.2 343.2		/	0.1																				
343.2 346.3		/	0																				
346.3 349.3		/	0																				
349.3 352.3		/	0.6																				
352.3 353.6		/	1.2																				
353.6 356.9		/	0.3																				

Redrilled core at end of run.

DRILLING DATA | GEOLOGICAL DESCRIPTION

DATE Aug.78

LOGGED BY A.W.P.

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
				LITHOLOGIC FEATURES																			
356.0 359.1		/	0																				
359.1 362.4		/	0.2																				
362.4 365.5		/	0																				
365.5 368.5		/	0.2																				
368.5 371.6		/	0																				
371.6 374.6		/	0																				
374.6 378.0		/	0																				
378.0 381.0		/	0																				
381.0 384.0		/	0.4																				
384.0 386.8		/	0																				
386.8 389.8		/	0.3																				
389.8 392.6		/	0.2																				
392.6 395.6		/	0																				
395.6 398.7		/	0																				
398.7 402.0		/	0	400.0	403.9	Coaly Clst. Carb. Sh.	Dk.Gy. to Gy.Blk.	S_5-R_1	Interbedded with Clst..				Clst.	0.9m	400.3 401.2	404.0	50°	Dist.	Frag. and crushed core.		400.0	400.9	Contacts are gradational but distinct.
402.0 405.1		/	0						Many thin Calcite band from 403.1-403.9				Shaly Coal	0.1m	403.0				Gen. Blocky with a few crushed zones		400.9	403.1	
																			Intact		403.1	404.2	

GEOLOGICAL DESCRIPTION

HOLE No. 78-200

DATE Aug. 78

LOGGED BY A.W.P.

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∠ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
405.1		/	0	403.9	422.7	Coal with minor Interbeds	Gy. Blk. to Blk.	S_4-R_1	Often grading into minor beds			5	P.W.	0.5	404.9	60°	406.9	Dist.			404.2	404.8	At 404.5 there is a fine white noncalcareous powder on fractured surface.
408.1				404.0	422.5											50°	413.8	Contort.	Frag(m)				
408.1		/	0						of Shaly Coal and Coaly Clst.				Ash	0.15	405.2	40°	419.6	Dist.	Gen. Intact with a few blocky and rbly. zones.		404.8	411.2	
411.2													P.W.	0.1	405.9								
411.2		/	0						some P.W. and Ash.				Ash	0.01	406.8								
414.2													Gouge	0.08	411.3								
414.2		/	0.4						The fracts. are often parallel to				Gouge	0.05	411.6				Shrd. zone with crsh. and 0.2m of gouge.	45°	411.2	412.1	
416.4													P.W.	0.1	413.8	50°							
416.4		/	0						the bedded but there are many				P.W.	0.1	416.9				Blocky to Intact.		412.1	413.2	
416.7													Carb.	0.3	419.6								
416.7		/	0.1						irregular fractures across the				Coaly Sh.	0.1	420.4				Crsh. core Intact.		413.2	413.7	
419.4																					413.7	413.9	
419.4		/	0						bedding and the occas. low angle										Shrd. zone with some crsh. and gouge.	45°	413.9	415.8	
422.5																50°							
422.5		/	0						fracture.										Gen. Intact with some blocky and rbly. zones.		415.8	421.5	
425.5		/	0.3																		421.5	422.5	Some monor shearing at 25°-40°
428.5		/	0																Gen. Frag. + crsh. with some blocky core.				
431.0		/	0	422.7	423.5	P.W. tonqueing into coal.	Med. Gy. to Yel. Gy.	R_1	On the contacts the P.W. slices							50°	423.7	Indist.	Intact.		422.5	423.9	
431.3		/	0	423.5	428.3	Shaly Coal with Coaly Clst.		S_3-R_1	into the coal. Much of the				Coaly Clst. and Gouge	1.5m	226.8 to 228.3				Gen. Intact with some blocky zones		423.9	425.5	
433.7		/	0.1						coal is poor with much crsh.										Gen. Crsh. gouge core with some intact zones	45°	425.5	428.7	
437.4		/	0.1	428.3	430.2	Clst. with some Carb. Clst.	Med. Lt. Gy. to Dk. Gy.	S_5	and gouge in shrd. zones.							50°	429.8	Dist.	Intact with a few minor Shrd.		428.7	430.0	
440.0		/	0	430.2	431.2	Coal	Dk. Gy. to Gy. Blk.	R_1											Gen. blocky with some crsh.		430.0	432.8	
443.5		/	0	431.2	434.3	Shaly Coal	Dk. Gy. to Blk.	S_3-R_1					P.W.	0.04	432.5	45°	433.9	Dist.	Gen. blocky with some intact zones		432.8	436.8	
446.5		/	0										Gougy Coal	0.2	433.4				and a few minor shrd.				
449.9																							

DATE Aug.78
LOGGED BY A.W.P.

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
449.9 452.9		/	0	434.3	436.0	Coal	Gy.Blk. to Blk.	R_1				2											
452.9 456.0		/	0	436.0	440.7	Clst. with some coaly Clst. and Carb.Clst.	Lt.Gy. to Med. Dk.Gy.	R_1	Contacts are gradational				Carb. Clst.	0.1	436.1	50°	438.8	Dist.	Rbly.		436.8	437.4	Upper part of this zon is carbonaceous and the lower part is massive
456.0 459.0		/	0										Coaly Clst. Carb. Clst.	0.4 0.3	436.3 437.0				Blocky with a few minor Shrd.		437.4	440.4	Clst.
459.0 462.0		/	0										Carb. Clst. Coaly Clst.	0.1 0.2	437.5 437.9								
462.0 465.1		/	0										Carb. Clst.	0.6	438.4								
465.1 468.2		/	0	440.7	442.2	Coaly Clst.	Dk.Gy.	S_4-S_5	Friable										Blocky to rbly. with many minor shrd. and crushing.		440.4	442.2	
468.2 471.2		/	0.1																				
				442.2	448.4	Interbedded Clst.+Slst with some Carb.Clst.	V.Lt. Gy.to Med.Gy.	S_5-R_1	Grading in and out from Clst.to Slst			Gyp.	Ash Carb. Clst.	0.15 0.1	442.5 446.0	55°	445.7	Indist.	Alternating rbly.and intact.		442.2	446.5	Upper and lower contac are gradational but distinct.
									Massive				Carb. Clst. Gougy Carb. Clst.	0.4 0.4	446.8 448.2				Crsh. and gougy with intact core 447.5-447.9		446.5	448.4	
				448.4	451.0	Coal	Gy.Blk. to Blk.	R_1											Blocky with some intact		448.4	451.0	The contacts aregradational but distinct.
				451.0	458.3	Coaly and Carb.Clst. with some interbedded Clst.	Med.Lt. Gy.to Dk.Gy.	S_5	Interbedded, gradational				Clst. Ash	0.4 0.1	451.8 455.5	50°	453.1	Indist.	Blocky with some shrd. and crsh. core.		451.0	455.3	
													Ash Irst.	0.15 0.15	457.3 458.0				Gen.intact but friable with some rbly.		455.3	458.3	
				458.3	468.0	Coal	Gy.Blk. to Blk.	R_1	Grades into Shaly coal in places.				Ash Ash	0.01 0.01	459.7 459.8	40°	460.2	Dist.	Blocky and rbly.with shrd.		458.3	459.2	
													Gougy most Ash	0.1 0.02	464.8 466.5	35°	463.0	Dist.	crsh. with minor gouge.				
				468.0	471.2	Carb. Clst.	Med.Dk. Gy.to Dk.Gy.	S_5	Interbedded with Clst. and Cgl.				Clst. Cgl.	0.2 0.1	468.3 468.5	40°	468.5	Dist.	Gen.intact core with some minor		459.2	471.2	
													Clst. Clst.	0.3 0.15	468.9 469.1				fragmented and crsh.				

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER 78-281

TYPE OF DRILLING NQ

COORDINATES UTM

DIP 90°

AZIMUTH ---------

LATITUDE 5,624,191 N

DEPARTURE 598,417 E

ELEVATION

GROUND 977.8m

REFERENCE 978.1m

DATE

STARTED Aug.28

COMPLETED Sept.5

DRILLED BY Coates Enterprises

LOGGED BY G.Green

GEOPHYSICAL LOGS BY Roke

TYPES Gamma, Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	86.	346.9	453.5m
2	87°	339.9	388.9
3	89°	26.9	306.6
4	88.5°	42.9	224.3
5	89.5		142.0

DRILLING DATA — GEOLOGICAL DESCRIPTION

HOLE No 78-281
DATE Sept.3,1978
LOGGED BY G.Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO	
0	/																						
				53.0																			
53.9		/	.6	53.4	228.0 229.0	Slst.	Gn.Gy. to Dk. Gn.Gy.	S_4-S_5	Massive weak fissle		Mir. Fe. Co_3					80°	55.0	Fe.Co_3 Sand	Basically Blocky-Rbly		53.5		Occassionally-closely broken.
56.4		/	0				Gy.	S_5-R_1	Massive Sl.Spkld.	Fine	Mir. Fe. Co_3		Ash	.1	54.9	70°	56.5	Fissility	Rbly. Brecc.		75.7	85.9	
59.5		/					Gy.Gr.	S_2	Bent., High % of Biolite	Clay	Bent		Ash	.1	85.8	70°	63.5	Faint Bedding	"		90.5	90.7	Mica., Quartz, Grains + Crystals.
62.8		/	.3				Gy. to Blk.	R_2	Massive		Fe. Co_3		Irst.	.2	119.5	70°	66.2	Dist.	Rbly.		102.5	.2	$CaCo_3$ (secondary) to $FeCo_3$.
65.8		/	0				Lt. Br.Gy.	"	"	Fine	"		"	.1	130.0	70°	75.3	Faint Bedding	Rbly. Brecc.		105.5	113.4	
68.9		/	0				"	"	"	"	"		"	.1	131.7	75°	94.4	Dist.	Closely Broken		116.0	124.1	
72.0		/	.3				"	"	"	"	"		"	.1	134.4	75°	101.2	Dist. Fissility	Rbly. Brecc.		124.1	124.5	
75.3		/	0				"	"	"	"	"		"	.1	137.6	70°	111.0	Dist.	Rbly.		139.0	139.3	
78.3		/	0				"	"	"	"	"		"	.1	138.8	70°	133.3	Dist.	Rbly. H. Fractured		152.1	152.7	
81.4		/	0					R_1	Brec. Slst.		"		Ca. Co_3	2.0	167.0	70°	137.7	Indist. Fissility	Rbly.		156.5	157.0	
84.4		/	0				Lt. Br.Gy.	R_2	Massive	Fine	"		Irst	.1	179.2	70°	140.8	Indist.	Pulv.		163.7	163.9	
87.5		/	0								$CaCo_1$ Fe.Co_3					75°	151.0	Indist.	Brecc. Healed with $CaCo_3$		166.9	169.0	Possible fault. Brecciated fault zone.
90.5		/	0				Lt. Br.Wh.	R_2	Brec.Bent. Slst.		Fe. Co_3		Irst	.1	196.4	80°	157.5	Fissile Disc.					
93.6		/	0				Lt. Ol.Gy.	S_4	Spkld.				Ash	.1	208.0	80°	178.6	Dist.					Bentonitic.
96.6		/	0													80°	185.6	Indist.					

HOLE No 78-281
DATE 9/3/78
LOGGED BY G.Green

DRILLING DATA				GEOLOGICAL DESCRIPTION																		
				LITHOLOGIC FEATURES														TECTONIC FEATURES				
RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
99.7		/	0				Br.Gy.	S_2	Bent.				Ash	.1	216.2	80°	205.4	Disc. Fissle	Pulv.		210.2	211.2	
102.7		/	0				Lt. Br.Gy.	R_2		Fine	Fe. Co_3		Irst.	.1	222.6	85°	215.1	Dist.					
105.8		/	0				Lt. Yel.Br.	S_2-R_1	Thin,Finely Dist.	Fine			Ash	.1	229.0								Gradational contact with Coal below.
108.8		/	0	228.0	252.6	Coal	Blk.-Br.Blk.	R_1-R_2	uneven Frac thinly Lam.			5-8				75°	230.5	Dist. thin Lam	Main.Blocky Occas.Pulv.				Thinly Lam.,Hard Coal.
110.9		/	.5										Carb. sh.	2.5	249.0	60°	233.5	Dist.	Pulv.		237.0	237.2	
113.4		/	0										"	.4	255.7	75°-80°	243.8	Dist.	Pulv.		240.1	240.3	
116.4		/	0										"	1.4	256.8	70°	247.2	Dist. Thin Ash	Pulv.		247.4	249.0	
119.5		/	0													60°-65°	251.3	Dist. Thin Lam	Rbly.		249.0	250.5	
122.7		/	0	252.6	262.1	Clst.	Med.Gy.	R_1	Interbedded		Fe. Co_3					70°	264.4	Dist.	Sound		258.2	265.0	
124.1		/	0								"		Irst.	.3	259.9								
126.5		/	.3								"		Irst.	.5	263.0								
130.1		/	1.0	262.1	436.1	Coal	Blk.	R_1	Massive to thinly Lam.		4-5					65°-75°		Over All	Main.Blocky occas.Pulv. Carb.Sh. Interbeds				Occasional P.W.
133.2		/	0				Dk.Gy.	S_4-S_5					Carb. Sh.	.8	270.0	70°	276.2	Dist. Thin Lam	Pulv.		270.0	270.8	
136.2		/	0				Dk. Gy.Blk.	"					Carb. Sh.	.2	271.4	70°	277.9	"	Pulv.		271.4	271.6	
139.3		/	0				Dk. Blk.GY.	"					C.Sh.	2.6	276.4				Pulv. Coaly Sh.		277.5	277.9	
142.3		/	0				Dk.Gy.	"	$FeCo_3$ Cement	Med. to Coarse			Carb. Ss.	2.8	279.0				Rbly.		282.4	282.0	
145.4		/	0					R_2	Highly Fractured		Fe. Co_3		P.W.	.4	282.0								

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-281
DATE 9/3/78
LOGGED BY G.Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO
148.4		/	0				Wh.	S_5-R_1	Contorted	Med.to Coarse			Ash	.1	283.9	60°	285.4	Contorted				
151.5		/	0				Wh.	S_4	Thin Beds	Fine	Bent		"	.2	291.6	60°	289.3	Thin Lam.				
154.5		/	0				Orng.	S_4-S_5	"	Fine			"	.1	294.0	70°	292.5	"	Rbly.to Puly.		294.4	295.4
157.3		/	0				Wh.	S_4-S_5	Contorted	Fine			"	.1	296.0	70°	297.5	"	Rbly.		295.9	295.8
160.5		/	0				Wh.	R_2	"		Fe. Co_3	40%	P.W.	.4	296.3							
163.7		/	0				Wh.	R_2	"		"		P.W.	.7	300.0							
166.7		/	0				Gy.	S_1	Highly Shrd.				Carb. SH.	1.7	300.7	60°	301.8	Contort. Carb.Bed	Pulv.	90°	300.7	302.7
169.8		/	0				Blk.	S_1					"		302.9				Pulv. Coal Sh.	90°	302.9	303.3
172.5		/	0				Br.Gy.	S_1	Very Soft				"		303.7							
175.6		/	.2				Br.Gy.	R_2	Carb.Sh. W. $FeCo_3$ cement		Fe. Co_3		Irst.	1.7	303.9							
178.8		/	0				Dk.Gy.	S_4					Carb. Sh.	1.8	305.2				Pulv.		307.0	307.1
182.0		/	0				Wh.	R_2	Contorted		Fe. Co_3		P.W.	.1	308.5				"		307.4	307.6
185.0		/	0				Wh.	R_2	"		"		P.W.	.1	309.8	65°	310.0	Thin Lam.	"		307.9	308.1
189.1		/	0				Br.	S_4-S_5					Carb. Sh.	.2	311.3				"		311.3	311.5
190.2		/	.1				Blk.Br.	S_4-S_5	Highly Frac.				Carb. Sh.	1.3	311.7				"		311.7	313.0
193.2		/	0				Gy.	R_1	Massive	Fine	Fe. Co_3		Ss.	.6	313.0				"		313.6	314.0
196.3		/	0					S_4					Carb. Sh.	.2	314.5				"		314.5	314.7

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE NO 78-281
DATE 9/3/78
LOGGED BY G.Green

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	LITHOLOGIC FEATURES: COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∠ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO
199.3		/	0				Wh.	R_2	Contorted		Fe. Co_3		P.W.	.7	315.7						
202.4		/	0				Dk.Gy.	S_5					Carb. Sh.	.6	317.6				Pulv.		319.1	319.5
205.4		/	0				Wh.	S_4	Mottled				Ash	.1	320.0	60°	320.7	Thin Lam.	Pulv.		319.8	320.0
208.7		/	0				Wh.	R_2	Contorted		Fe. Co_3		P.W.	.1	321.7						
211.7		/	0				Med. Gy.	R_2	Massive	Med.			Ss.	.3	322.6						
214.9		/	0				Br.Or.	S_4-S_5	Interbed	Fine			Ash	.1	325.3						
217.9		/	0				Med. Gy.	S_4-S_5					Carb. SH.	2.5	328.3				Pulv.		328.3	330.8
221.0		/	0				Med. Gy.	R_1-R_2	Massive	Med. Coarse	Fe. Co_3		Ss.	.3	330.8						
224.2		/	0				Dk. Br.Gy.	S_3	Interbed				Carb. Sh.	.6	333.0	65°	334.4	Thin Lam.	Pulv.		330.0	330.6
227.4		/	0				Med. Gy.	S_3					"	.2	336.6						
230.4		/	0				Med. Gy.	S_4					"	1.8	337.1						
233.5		/	0				Med. Gy.	R_1	Massive	Med.			Ss.	.3	338.9						
236.7		/	0				Med. Gy.	R_1					Carb. Sh.	.8	339.2						
239.9		/	0				Dk.Gy.	R_1	Massive Interbed				Carb. Ss.	1.7	340.0				Rbly.		343.6	343.9
242.9		/	0				Or.	S_5	Thin Ash				Ash	.01	345.3	70°	345.3	Thin Ash				
245.9		/	0				Yel.Br.	S_5	Thin Ash				Ash	.01	345.7							
249.0		/	0				Wh.	R_1	Contorted				P.W.	.1	346.0							

DATE 9/3/78
LOGGED BY G.Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO
252.1		/	0				Br.Or.	S_5	Thin Inbed.	Fine			Ash	.1	347.4				Pulv.		348.0	348.1
255.1		/	0				Dk. Gy.Br.	S_3					Clst.	.2	352.7				"		348.3	348.8
258.2		/	0				Dk.Gy.	S_3					Clst.	2.2	353.4				"		352.7	352.9
261.2		/	0				Or.	S_4	Interbed.	Fine			Ash	.1	358.5				"		353.4	355.6
264.2		/	.1				Blk.	S_5	Interbeded Shrd.				Coaly Sh.	.6	359.5				"		359.5	360.1
267.3		/	0				DK.Gy.	S_4	Shrd.				Carb. Sh.	1.6	366.0	70°	365.1	Thin Lam.	"		366.0	367.6
270.3		/	0				"	"	"				"	.1	368.9				"		368.8	369.0
273.4		/	0				"	"	"				"	.3	370.3				Rbly.		370.3	370.6
276.4		/	0				"	"	"				"	.4	371.8				Pulv		371.8	372.2
279.5		/	0				"	"	"				"	.8	374.4	65°	377.2	Thin Lam.	"	-90	374.4	375.2
282.2		/	0				"	"	"				Coaly Sh.	1.5	380.1				"		380.1	380.5
285.3		/	0				Dk.GY. to Blk.	S_5	Interbeded				Carb. Sh.	4.5	384.5				Rbly.		395.0	395.3
288.0		/	0				Wh.to Med.- Lt.Gy.	R_2	Contorted		Fe. Co_3		P.W.	.6	389.2	60°	390.7		Pulv.		399.0	400.0
291.4		/	.2				Blk.Gy.	S_4	Slightly Shrd.				Carb. Sh.	.2	392.5				Rbly.		404.4	405.1
294.4		/	0				Wh.	R_2			Fe. Co_3		P.W.	.2	393.8				Rbly.		407.4	408.0
297.5		/	0				Br.Blk.	S_4	Interbeded Clst. + Ss.				Clst. + Ss.	1.2	394.2							
300.7		/	0				Blk.	S_4	Interbeded within Coal				Carb. Sh.	.4	395.6							

HOLE No 78-281
DATE 9/3/78
LOGGED BY G.Green

DRILLING DATA				GEOLOGICAL DESCRIPTION																			
				LITHOLOGIC FEATURES															TECTONIC FEATURES				
RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∢ to C.A.	BEDDING AT	BEDDING COMMENT	DESCRIPTION	∢ TO C.A.	INTERVAL FROM	INTERVAL TO
303.7		/	0				Dk.Gy.	R_2	Well Cemented	Fine	$Fe.Co_3$		Ss.	.7	399.0							
306.9		/	0											.1	401.5	60°	401.0	Thin Lam Dist.				
310.0		/	0				Dk.Br.	S_2-R_1	Interbedded Clst.+ Irst.		$Fe.Co_3$		Clst.	1.5	404.3							
313.0		/	0				Dk.Br. to Blk.	S_4	Interbedded				Carb. Sh.	.2	406.0							
316.1		/	0				Dk. Blk.Gy.	S_3					Carb. Sh.	.7	407.2				Highly Frac + Shrd.		407.2	407.9
319.1		/	0				Lt. Yel.Br.	R_1	Fissle	Fine			Ash	.2	408.7	70°	409.0	Thin Ash Dist.				
322.2		/	0				Lt.Br.	R_2		Fine			Irst.	.7	411.8							
325.2		/	0				Ol.Gy.	S_4					Carb. Sh.	.7	412.5							
328.3		/	0				Med. Gy.	R_2		Fine			P.W.	.3	415.1							
331.3		/	0				Blk.	R_2	Factures				Sh. Coal	.6	415.4							
334.3		/	0				Ol.Gy.	S_5					Clst.	2.2	416.6							
337.1		/	0				Ol.Gy.	R_1			$Fe.Co_3$		Clst.	.7	421.8							
340.3		/	0				Med. Br.	S_5		Fine			Ash.	.1	422.5	65°	422.5	Thin Ash Indist.	Rbly. Shrd.		426.4	427.2
343.9		/	0				Med. Lt.Gy.	S_4					Clst.	.9	426.4				Rbly.		428.0	428.8
346.5		/	0				Dk.Gy.	S_3					Carb. Sh.	.1	428.5				Pulv.		431.0	431.4
349.6		/	0				Dk.Gy.	S_3					Carb. Sh.	.4	430.6	75°	430.4	Dist.	Rbly.		453.4	454.7
352.7		/	.3				Gy.Wh.	R_2	Contorted				P.W.	1.0	433.8							

HOLE No/8-281
DATE 9/3/78
LOGGED BY G.Green

DRILLING DATA				GEOLOGICAL DESCRIPTION																	
				LITHOLOGIC FEATURES														TECTONIC FEATURES			
RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∢ to C.A.	BEDDING AT	BEDDING COMMENT	DESCRIPTION	∢ TO C.A.	INTERVAL FROM	INTERVAL TO
355.7		/	0				Gy.Blk.	S_2	Shrd.				Carb. Sh.	.4	436.0						
358.3		/	0				Gy.Blk.	S_2	Sound				Carb. Sh.	.2	439.5	70°	439.0	Clst. Dist.			
361.5		/	.1	436.1	446.0	Ss.	Lt. Bl.Gy.	R_1	Interbedded	Fine-Coarse									Generally Sound		
364.5		/	0				Ol.Gy.	S_4		Fine			Clst.	2.4	440.0						
367.6		/	0				Lt. Bl.Gy.	R_1	Interbedded	Fine-Coarse			Ss.	3.2	442.4						
370.6		/	0				Lt. Gy.Blk.	S_4	Interbedded				Carb. Sh.	.8	445.6						
374.0		/	0	446.0	456.5	Carb.Sh.	Gy.Blk.	S_4	Thinly Interbedded							70°	449.0	Thin Carb Silt.Dist			
377.0		/	0				Gy.Blk.	S_4	Interbedded				Clst.	1.6	453.0	70°	451.0	Thin Carb.Silt			
380.1		/	0																		
383.1		/	0																		
386.2		/	0																		
389.2		/	0																		
392.5		/	.2																		
395.3		/	0																		
398.4		/	0																		
401.4		/	0																		
404.4		/	0																		

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-281
DATE 9/3/78
LOGGED BY G.Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: X to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	X TO C.A.	INTERVAL FROM	INTERVAL TO
407.5		/	0																			
410.5		/	.1																			
413.6		/	0																			
416.6		/	0																			
419.7		/	0																			
422.9		/	0																			
425.8		/	0																			
428.8		/	0																			
431.9		/	0																			
434.9		/	0																			
438.0		/	0																			
441.0		/	0																			
444.1		/	0																			
447.1		/	0																			
450.2		/	0																			
453.2		/	0																			
455.7		/	0																			

HAT CREEK PROJECT

140

COLLAR DATA.

HOLE NUMBER 78-283

TYPE OF DRILLING NQ

COORDINATES UTM

DIP -70°

LATITUDE 5,624,885 N

AZIMUTH 270°

DEPARTURE 599,088 E

ELEVATION

GROUND 877.9m

REFERENCE 878.4m

DATE

STARTED Sept.6

COMPLETED Sept.7

DRILLED BY Coates Enterprises

LOGGED BY G.Green

GEOPHYSICAL LOGS BY Roke

TYPES Gamma,Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	69°	268.9	92m
2			
3			
4			

HOLE N678-283

DATE Sept.78

LOGGED BY G.Green

DRILLING DATA				GEOLOGICAL DESCRIPTION															TECTONIC FEATURES				
				LITHOLOGIC FEATURES																			
RUN FROM.	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL		ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTER-ISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS			BEDDING			DESCRIP-TION	X TO C.A.	INTERVAL		
				FROM	TO								TYPE	Thick-ness	AT	X to C.A.	AT	COMMENT			FROM	TO	
0	/			0	20.1	O.B.																	
8.3		/	1.6																				
20.1		/	0	20.1	92.7	Coal	Blk.	S_3-S_5	Shrd. Massive			5%		.1		45-55		dis-tinct.	Blocky to Rbly. Pulv.		20.1	92.7	General shearing parallels to bedding.
22.3		/	0				Lt. Br.	S_5		Fine			Ash	.1	32.9				Pulv. to Brecciated		20.1	26.9	
24.7		/	0				Blk.	S_3	H.Rbly., Shrd.+Pulv.				Carb. Sh.	.6	45.4				Rbly.		26.9	56.7	
25.9		/	.1				Dk. Gy.	R_1-R_2	Contorted		Fe Co_3		P.W.	.8	60.0				Blocky to frequently Pulv.		56.7	89.7	
29.0		/	1.1																Pulv. to Rbly.		89.7	92.7	
31.4		/	0																				
33.5		/	.4																				
35.4		/	1.4																				
38.4		/	1.4																				
41.5		/	0																				
44.5		/	0																				
47.5		/	0																				
50.6		/	0																				
52.1		/	0																				
54.6		/	0																				

DRILLING DATA | GEOLOGICAL DESCRIPTION

DATE Sept.78
LOGGED BY G.Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO
56.7		/	0																			
59.7		/	0																			
62.8		/	0																			
65.8		/	0																			
68.9		/	0																			
71.9		/	0																			
75.0		/	0																			
78.0		/	.2																			
81.1		/	0																			
84.1		/	0																			
87.2		/	0																			
90.2		/	0																			
97.7			END.																			

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER DDH-78-284

TYPE OF DRILLING NQ

COORDINATES UTM

DIP 90°

AZIMUTH ———

LATITUDE 5,626,959 N

DEPARTURE 599,713 E

ELEVATION

GROUND 957.3 m

REFERENCE 957.8 m

DATE

STARTED Sept.7

COMPLETED Sept.10

DRILLED BY Coates Enterprises

LOGGED BY H.Kim,D.Kneale

GEOPHYSICAL LOGS BY Roke

TYPES Gamma, Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	87°	122.9	195m
2			
3			
4			

* Depth for detailed logging the surface materials is measured in 'feet' by D. Kneale of Golder Associates.

HOLE No 78-284
DATE Sept.9/78
LOGGED BY D.Kneale

DRILLING DATA				GEOLOGICAL DESCRIPTION															TECTONIC FEATURES			
				LITHOLOGIC FEATURES																		
RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO
		/	-----	244.5	253.0	Sand	Lt.Br.	V.Dense		M.toC.			Med. Grvl.	.25'	244.5 249.0	Hor.						
			-----	253.0	257.0	Sand + Grvl.	Med.Br.	"		C.toF.						"						
	---			257.0	260.3	Sand	Dk.Br.	"	Organic	M.toC.						"						
267			3.0'	260.3	298.0	Sand occ.fine Grvl.	Med.Br.	"	Oxidized	M.toC.			Carb. Silt. Clst	.10' .20'	Inter-mit. 287.0	"						
277			2.0'	298.0	303.5	Sand	Dk.Gy.	"	Organic	F.toM.			Coal	.40'	302.0	"						
317			5.2'	303.5	409.5	Sand Tr. Silt.	Med.Gy.	"		F.			F. Sand, F. Grvl.	1.5 '	325.0	"						
				409.5	412.0	Silt.	"	Hard		M.						"						
				412.0	419.7	Sand	"	"		F.						"						
				419.7	424.0	Silt.	"	"		M.			Cl. Silt.	.30'	419.7	"						
				424.0	432.5	Sand Tr. Silt.	"	"		F.toM.						"						
				432.5	437.0	Silt.	"	"		M.						"						
				437.0	441.0	Silt. Sand	"	V.Dense		M.toF.						"						
				441.0	469.4	Silt. Tr. Sand	"	"		M.toF.						"						
487			4.0'	469.4	514.0	Silt. Tr. Clay	"	Hard		M.			Med. Grvl.	.30'	514.0	"						
497			7.5'	514.0	527.0	Grvl.	"	V.Dense		M.toC.												
507 517			5.0' 9.5'	527.0	541.0	Silt.	"	Hard		M.						"						
547			2.5'	541.0	557.0	Silty Sand	"	V.Dense		F.						"						

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-284
DATE Sept.78
LOGGED BY D.Kneale

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: % to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	% TO C.A.	INTERVAL FROM	INTERVAL TO
557		/	9.8'	557	557	Grvl. some Sand	Dk.Gy.	V.Dense		M.toF.												
567		/	9.2																			

DRILLING DATA | GEOLOGICAL DESCRIPTION | HOLE No 78-284 | DATE Sept.78 | LOGGED BY H.Kim

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING % to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES % TO C.A.	INTERVAL FROM	INTERVAL TO	
						(Surface materials down to 175.9m logged in detail by David Kneale, Golder Associates,																	
						the following is only a general observation of the core surface materials by H. Kim).																	
		/		0	74.6																		
				74.6	90.7	Mainly Sand				0.5									Unconsolidated		74.6	90.7	*Mainly sand, but contains sporadic gravels up yo 1% overall section, pebble ranges in size from 2to5cm.
				90.7	172.0	Silt.													Semi-indurated		90.7	172.0	*Not indurated as the claystone of Medicine Creek formation .
				172.0	183.0	Saprolite or Regolith of Dacite flow Brecc.	Lt. Gr.Gy.	Mod. Soft											Semi-consolidated		172.0	183.0	*Kaolinized fragments, angular to subangular, 30-50% in a light greenish-grey clayey matrix;talus?
				183.0	203.0	Tuff. Dacitic.	Lt.Gy. with Gr tinge.	Hard to V. Hard	Semi-Siliceous (acidic)				Breco	5cm	192.1	85° 80°	183.0-182.8 185.8-184.2	Layering "	Joint 85 to Ca.		183.0 185.8	185.8 184.2	* Numerous shears/broken into pieces along joints, appear to be ocurring along the tuffaceous bedding layers.
189.8 172.8		/	2.9m				Occas. jasperoidal coloring	Hard	Highly jointed along				"	20cm	192.6	85°	190.6-190.7	Vein 2mm along layer	Broken		183.0	187.5	
172.8 175.9		/	2.8m					Mod. Hard	tuffaceous layering					5cm	193.6	90°	191.7-192.1	Layering	Semi-Kaolinized and Shrd.		187.5	189.4	
175.9 182.0		/	3.7m					V. Hard						25cm	194.2	40°	192.1-192.6	"	(Intact) sound unbroken		189.8	190.2	
182.0 185.0		/	0					Hard						10cm	201.8	50°	199.4	"	Blocky Bleached		190.2	191.0	
185.0 188.0		/	0					Mod. Hard and Soft						40cm	202.5				Shrd, + Semi-bleached		191.0	191.2	
188.0 191.1		/	0.3					Hard											Blocky.		191.2	191.7	
191.1 194.2		/	0					V. Hard											Intact		191.7	192.2	
194.2 197.2		/	0					Hard											Blocky to Rbly.		192.2	198.0	
197.2 199.9		/	1.3																Rbly. to Pulv.		198.0	203.0	*Broken to .5-1cm chunks moderate Kaolinization along joints, joints follow bedding.

DRILLING DATA | GEOLOGICAL DESCRIPTION

DATE Sept.78

LOGGED BY H.Kim

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZAT (ION)	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∡ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∡ TO C.A.	INTERVAL FROM	INTERVAL TO	
99.9 03.0		/	0	203.0	206.0	Tuff. Rhyo-Dacite	Dk.Gr.	V.Hard								40°	203.7	Layering	Intact to Blocky		203.0	204.5	At 203.5 moderate bleaching along layers.
03.0 06.0		/	0.1					Mod.Soft to Mod.Hard											Rbly.		204.5	205.5	Moderate bleaching.
06.0 09.2		/	0					V.Hard R_1											Intact Pulv.		205.5 205.9	205.9 206.0	Moderate Kaolinization.
09.2 12.4		/	0.1	206.0	215.5	Rhyo-Dacite flow Breccia	Lt.Gr.-Gy.+local Jasperoidal tinge	S_4 Mod.Soft											Rbly. Mod. Kaol.		206.0	206.5	Lt.Gy. Dacite fragments-.5-3cm in aphanitic Rhyo Dacitic Matrix; locally Dacitic-Andesitic
12.4 15.5		/	0					V.Hard								30° 80°	206.6 209.2	Flow	Intact to Blocky		206.5	209.4	
								Mod.Hard											Rbly.		209.4	210.3	
								V.Hard											Intact to Blocky		210.3	215.5	215.0-215.5 Dacite.

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER 78-285

TYPE OF DRILLING NQ

COORDINATES UTM

DIP -50°

AZIMUTH 270°

LATITUDE 5,624,885 N

DEPARTURE 599,087 E

ELEVATION

GROUND 877.9m

REFERENCE 878.4m

DATE

STARTED Sept.8

COMPLETED Sept.9

DRILLED BY Coates Enterprises

LOGGED BY G. Green

GEOPHYSICAL LOGS BY Roke

TYPES Gamma, Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	51.5°	266.9	138.4
2			
3			
4			

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-283
DATE Sept.10,1978
LOGGED BY G.Green

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING X to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES X TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
20.0	/																							
61.5		/	0	61.5	68.9	Coal	Blk.	S_3-R_2	Massive to Pulv.			5%							Mainly Blocky Rbly		65.8	66.3		
62.8		/	.5	68.9	81.3	Coal Triconed																		
65.8		/	2.0	81.3	139.0	Coal	Blk.	R_1	Massive thinly lam.			5 10							Mainly Blocky occ. Pulv.		81.3	139.0		
68.0		/	0		(End)		Bl. Gy.	S_4-S_5	Bent. Tuff.				Slst.	.7	83.8	30°	68.0	Thin lam.					Generaly core is sound to Blocky, occassionally
68.6		/	0				Yel. Gy.	"	Bent. Tuff.				Slst.	.6	85.3	55°	86.2	Thin lam.	Pulv. fault		81.3	87.0	Rubbly to pulverized. Two possible fault zones
68.9	/						Bl. Gy.	"	Bent. Tuff.				Slst.	.3 .3	87.2 86.5	60°	91.6	Thin lam.					occures at 81.3 and 113.1 meters. Both zones show a
81.3		/	0				Yel. Gn.	S_3	Bent. (very)				Clst.	.2	90.8	30°	97.5	Thin lam. Dist.	Pulv.		93.0	94.0	high degree of pulverization and the claystone
83.8		/	0				Br. Gy.	S_4-S_5	Contorted with coal				Carb. Sh.	.3	101.6	40°	106.6	"	Pulv.		98.7	99.1	interbeds are highly tuffaceous and are altering to Bentonite.
86.0		/	0				Med. Gy.	R_2	Massive				Irst.	.3	103.0	40°-50°	107.4	"	Highly Bent. poss.fault		113.1	115.6	
88.1		/	0				Ol. Gr.	S_3	Bent. Tuff.				Ash.	.2	112.8	55°	119.2	"					
91.1		/	0				Bl. Gy.	S_2	Bent. Tuff.				Ash.	.2	113.1	55°-60°	124.8	Dist. thin lam.					From 115 to 139.0 m, the core is very sound and
94.5		/	0				Med. Bl. Gy.	S_2	Tuff. very Bent.				Clst.	1.4	113.7	70°	130.0	"					appears to be "B" coal, possibly even "D"?
97.5		/	0				Med. Ol. Gy.	S_2-R_2	Bent.		Fe Co_3		Clst.	.8	119.5	50°	136.0	Thin lam. Dist.					
100.6		/	0																					
103.9		/	0																					
			0																					

CORE DATA — GEOLOGICAL DESCRIPTION

HOLE NO 78-289

DATE Sept. 10, 1978

LOGGED BY G. Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∢ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∢ TO C.A.	INTERVAL FROM	INTERVAL TO	
107.0		/	0																				
110.0		/	0																				
113.1		/	1.0																				
116.1		/	0																				
119.2		/	0																				
122.2		/	0																				
123.7		/	0																				
126.8		/	0																				
129.8		/	0																				
132.9		/	0																				
135.9		/	0																				
139.0			END																				

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER DDH-78-286

TYPE OF DRILLING NQ

DIP 50°

AZIMUTH 130°

COORDINATES UTM

LATITUDE 5,624,887 N

DEPARTURE 599,093 E

ELEVATION

GROUND 878.2m

REFERENCE 878.4m

DATE

STARTED Sept.10

COMPLETED Sept.11

DRILLED BY Coates Enterprises

LOGGED BY N.P.Crocker

GEOPHYSICAL LOGS BY Roke(Earle

TYPES Gamma,Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1			
2			
3			
4			

HOLE No 78-286
DATE Sept/78
LOGGED BY Neil Crocker

DRILLING DATA				GEOLOGICAL DESCRIPTION																TECTONIC FEATURES				
				LITHOLOGIC FEATURES																				
				GEOLOGICAL INTERVAL								MINOR INTERBEDS			BEDDING						INTERVAL		
RUN FROM	TRICONED	CORED	CORE LOSS	FROM	TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	TYPE	Thickness	AT	X to C.A.	AT	COMMENT	DESCRIPTION	X TO C.A.	FROM	TO	
0																							
7.6	/			0	27.6	O.B.																	
7.6						Welded			Massive														
8.0		/	0	27.6	28.0	tuff		R_2	pyroclastic										Blocky				Boulder at bottom of O.B.
8.0																							
0.0		/	1.6m	28.0	29.7	O.B.																	1.6m core loss at bottom of O.B.
0.0					36.7				Massive										Highly				
1.1		/	0.1	29.7		Coal	Blk.	S_5-R_1	where not pulverized							50°	31.0	Dist.	Sheared-Pulverized		39.7	37.0	
11.1				36.7	38.0	Carb.													Fault-Sharp		38.5		
12.3		/	0.5			Shale	Br.Blk.	S_4	Friable										contact	25°	38.0		Very sharp contact between Coal + Clst.
12.3				38.0	49.7								Carb. + Ash					Clay Carb Indist. Carb.					
15.4		/	1.5			Claystone	Ol.Gy.	S_2	Massive					4cm	44.9	5°	44.9		Rbly.				
15.4				(End)														Dist. Bent Clay					
18.4		/	0.2																				
18.4																							
19.0		/	0.3																				
19.0																							
19.3		/	0																				
19.3																							
20.2		/	0.3																				
20.2																							
23.3		/	0																				
23.3																							
24.8		/	1.0																				
24.8																							
27.9		/	0																				
27.9																							
29.7		/	0.1																				

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER 78-287

TYPE OF DRILLING Diamond

COORDINATES UTM

DIP -90°

AZIMUTH 0

LATITUDE 5,625,197 N

DEPARTURE 599,129 E

ELEVATION

GROUND 921.2 m

REFERENCE 921.8 m

DATE

STARTED 11 Sept. 1978

COMPLETED 12 Sept. 1978

DRILLED BY Coates Enterprises

LOGGED BY N/A

GEOPHYSICAL LOGS BY N/A

TYPES

DIP TEST no.	DIP	AZIMUTH	LENGTH
1			
2			
3			
4			

* No geologic logging was done.
* The hole was abandoned at 42.8 m in O.B.
* Casings stuck in glacial till materials.
* Artesian aquifer at approximately 28 m(?).

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER DDH-78-288

TYPE OF DRILLING Diamond NQ

COORDINATES UTM

DIP -70°

AZIMUTH 0°

LATITUDE 5,624,824 N

DEPARTURE 599,065 E

ELEVATION

GROUND 878.3m

REFERENCE 878.4m

DATE

STARTED Sept.11

COMPLETED Sept.12

DRILLED BY Coates Enterprises

LOGGED BY N.P. Crocker
H. Kim

GEOPHYSICAL LOGS BY Roke (Earle Outcalt)

TYPES Gamma, Density

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	71°	0°	79.6m
2			
3			
4			

DRILLING DATA — GEOLOGICAL DESCRIPTION

DATE Sept/78
LOGGED BY N.P.C.,H.K.

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
					26.2																		
27.7		/	1m	0	28.0	O.B.																	
				26.2	65.3		Ol. Gy.											Dist.					
29.3		/	0			Clst to Slst		S3	massive							80°	43.4	Bed.	Blocky				Medicine Creek Formation
37.3		/	0													80°	46.3	"					
35.4		/	0														55.1	Indist.					Clst. grades Ol. Gy. to Lt.Gy. colour.
58.4		/	0													90°	63.3	"					Clst. grades Lt.Gy. to Dk.Ol. Gy.
41.5		/	0																Fault		65.3		Fault contact has no consp gouge + shrd. materials.
44.5		/	0																				Sl. shrd. at intermixed coal + claystone.
47.5		/	0.2	65.3	72.1	Coal	Blk.	R1	massive + lensed										Blocky to intact				
50.6		/	0													60°	66.0	Dist. vitrain					
53.6		/	0.1																				
56.7		/	0.2	72.1	72.4	Irst.	Yel. Br.	R2	massive		Sid												
59.7		/	0.1	72.4	81.1	Coal		R1	massive + lensed							55°	74.0	Dist. vitrain	Blocky to intact				
62.8		/	0.1		(End)											55°	79.0	Indist.					
65.8		/	0.2																				
68.9		/	0.4																				
71.9		/	0.5																				

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-

DATE Sept/78

LOGGED BY N.P.C., H.K.

DRILLING DATA				GEOLOGICAL DESCRIPTION																			
				LITHOLOGIC FEATURES															TECTONIC FEATURES				
RUN FROM-	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL		ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTER-ISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS			BEDDING			DESCRIP-TION	X TO C.A.	INTERVAL	
				FROM	TO								TYPE	Thick-ness	AT	X to C.A.	AT	COMMENT			FROM	TO
5.0		/	1.3																			
8.0		/	0																			
1.1			END																			

HAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER 78-290

TYPE OF DRILLING NQ

COORDINATES UTM

DIP 90°

LATITUDE 5,625,725 N

AZIMUTH ----

DEPARTURE 599,116 E

ELEVATION

GROUND 949.4m

REFERENCE 950.0m

DATE

STARTED Sept. 13

COMPLETED Sept. 16

DRILLED BY Coates Enterprises (Morris Fern Dick Claude)

LOGGED BY G. Green

GEOPHYSICAL LOGS BY Roke(E.Outcalt) (B.Banks)

TYPES Gamma Density Focus Beam

DIP TEST no.	DIP	AZIMUTH	LENGTH
1	88.8°	6.9	257.3m
2			
3			
4			

DATE 9/15/78
LOGGED BY G. Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∠ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
0	/			0	108.0	Slt., Snd., + Gvl.		S_1-S_2	Grad.	Slt. to cobbles													
05.8		/	0	118.0	120.1	(Triconed) Coal																	
08.2		/	.2																				
09.4		/																					
09.6	/																						
20.1		/		120.1	262.7	Coal	Blk.	S_5-R_1	Massive to thinly lam.		Fe S_5	5%				65°-75°	121.6	Dist. contort.	Gen. Blocky + Rbly.				Block to occas. Rbly. minor Pulv.
23.4		/	0				Gy.Blk.	S_2-S_4	Massive				Carb. Sh.	1.5	157.0	70°-75°	123.4	Dist.	Rbly.		126.3	126.5	Minor FeS_2 staining on factures.
25.5		/	.2				Blk.	S_2	Pulv.				Shaly Coal	2.0	163.0	60°	135.7	Dist.	Rbly.		130.3	130.5	
29.7		/	0				Gy.Br.	S_2	Massive				Clst. Carb. Sh.	.2	168.9	65°	144.1	Disc. Dist.	Pulv.		131.5	131.7	
32.9		/	0				Wh.	S_3	Massive				Ash	.2	169.5	65°	148.8	Dist.	Pulv.		134.2	137.4	
35.9		/	0				Dk.Gy.	S_2	Massive brec.				Carb. Sh.	1.2 .1	167.8 170.0	60°	160.4	Dist.	Rbly.		138.8	139.0	
39.0		/	0				Dk.Gy.	S_2	"				C. Sh.	.1	171.8	70°	181.0	"	Rbly.		157.0	157.3	
42.0		/	0				Blk.	S_2	"				Carb. Sh.	.2	177.4	70°	191.0	"	to Pulv.		163.0	165.0	
42.6		/	.1				Gy.Blk.	S_2-S_4	"				C. Sh.	.7	184.0	80°-90°	209	"	Rbly.		168.2	168.4	
47.2		/	0				Gy.Wh.	S_4-S_5	Spkld.				Ash	.2	196.8	65°	230	"	Pulv.		169.2	169.4	
48.7		/	0				Gy.Wh.	S_4-S_5	Splkd.				Ash	.2	201.7				Rbly.		175.0	175.4	
151.8		/	0				Blk.	S_3	Massive pulv.				Carb. Sh.	.2	207.1				Rbly.		215.0	215.0	

DRILLING DATA | GEOLOGICAL DESCRIPTION | TECTONIC FEATURES

HOLE No 78-290
DATE 9/16/78
LOGGED BY G. Green

RUN FROM	TRICONED	CORED	CORE LOSS	GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO	
154.8		/	0				Blk.	S_2	Pulv.		$CaCo_3$		Coaly Sh.	.2	229.2				Pulv.		229.2	229.5	
157.3		/	0				Wh.	S_4	Finely disseminated				Ash	.1	242.0								
160.5		/	0				Wh.Gy.	R_2	"		FeS_2		FeS_2	.1	249.4								
166.7		/	0				Gy.Wh.	S_5	Contort.				Ash	.1	259.1								
169.8		/	0				Blk.	S_5	Massive				Carb. Sh.	1.3	261.4								
172.8		/	0	262.7	267.3	Ss.,Clst. + Slst.	Bl.Gy.	S_5	Interbed.		$CaCo_3$								Rbly.		262.7	267.3	$CaCo_3$ in Ss.
175.9		/	0		(End)		Blk.	S_4	Pulv.				Carb. Sh.	.1	267.2				Pulv.		267.2	267.3	
178.9		/	0																				
182.0		/	0																				
185.0		/	0																				
188.1		/	0																				
191.1		/	0																				
194.1		/	0																				
197.2		/	0																				
200.2		/	0																				
203.3		/	0																				
206.4		/	0																				

DATE 9/15/78
LOGGED BY G. Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES																TECTONIC FEATURES			
				GEOLOGICAL INTERVAL		ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTER-ISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS			BEDDING			DESCRIPTION	∢ TO C.A.	INTERVAL	
				FROM	TO								TYPE	Thickness	AT	∢ to C.A.	AT	COMMENT			FROM	TO
209.4		/	0																				
212.4		/	0																				
215.5		/	.7																				
218.2		/	0																				
221.6		/	.1																				
224.6		/	0																				
227.7		/	0																				
230.7		/	0																				
233.8		/	0																				
236.8		/	0																				
239.6		/	0																				
242.6		/	0																				
245.7		/	2.9																				
248.7		/	1.5																				
250.7		/	1.1																				
252.1		/	.3																				
252.7		/	0																				

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-290
DATE 9/15/78
LOGGED BY G. Green

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∠ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES DESCRIPTION	TECTONIC FEATURES ∠ TO C.A.	TECTONIC FEATURES INTERVAL FROM	TECTONIC FEATURES INTERVAL TO
255.1		/	0																			
258.2		/	0																			
261.2		/	0																			
267.3		/	0																			
(End)																						

COLLAR DATA

140

HOLE NUMBER 78-291

TYPE OF DRILLING NQ

	COORDINATES	UTM	ELEVATION	DATE
DIP -90°	LATITUDE	5,625,429 N	GROUND 954.1m	STARTED 17 Sept.1978
AZIMUTH	DEPARTURE	599,276 E	REFERENCE 953.9m	COMPLETED 19 Sept.1978

DRILLED BY Coates Enterprises (Frank Thelland & Tony Pikor)

LOGGED BY H. Kim

GEOPHYSICAL LOGS BY N/A

TYPES

DIP TEST no.	DIP	AZIMUTH	LENGTH
1			
2			
3			
4			

*Ended in the Medicine Creek Formation Claystone, olive grey colored.

*For 4 m run, only 50% core recovery.

*No geophysical logging and Sperry-sun were taken due to an emergent circumstance; recovering the 125' of NQ rods broken in the squeezing ground.

*The hole is in proximity of Finney Fault.

DATE 19, Sept. 1978
LOGGED BY H. K.

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING ∢ to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	∢ TO C.A.	INTERVAL FROM	INTERVAL TO
140.2																						
140.2 142.0		/	1.5	140.2	144.2	Clst.	Ol.Gy.	R_1	Massive										shrd. pulv.		140.2	141.7
142.0 143.3		/	1.0																fault shears		141.7	142.0
143.3 144.2		/	0.4																shrd. rbly.		142.0	143.3
																			slksd. shrd.		143.3	143.9
																			rbly.		143.9	144.2

* Unsatisfactory coring as above took almost 12 hours, resulting in:

1. Broken rods
2. Two trinones completly worn out

* It appears that the Finney Fault is in proximity to the hole.

* The hole was shut down at 144.2m , due to a severe squeezing condition beyond control.

RAT CREEK PROJECT

COLLAR DATA.

140

HOLE NUMBER 78-292

TYPE OF DRILLING NQ

COORDINATES UTM

DIP - 90°

LATITUDE 5,625,885 N

AZIMUTH

DEPARTURE 598,927 E

ELEVATION

GROUND 932.0

REFERENCE 932.7

DATE

STARTED 18 September 1978

COMPLETED 20 September 1978

DRILLED BY Coates, Dick Vangle

LOGGED BY H. Kim

GEOPHYSICAL LOGS BY Roke, (Earl Outcalt)

TYPES Gamma, Density, Focused beam (20 cm scale)

DIP TEST no.	DIP	AZIMUTH	LENGTH
1			
2			
3			
4			

* Confirmed the bottom of 'D' coal.

DRILLING DATA — GEOLOGICAL DESCRIPTION

HOLE No. 78-292
DATE 19 Sept. 1978
LOGGED BY H. Kim

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∠ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
94.3	x				99.1	Coal	Blk.	4, R2				Carb.sh. or	coal	0.2	95.0				Blocky				
94.3 96.6		x	0										Clst.	0.2	95.6								
96.6 99.7		x	0.1										Clst.	0.1	96.6	65°	96.2	Distinct					
99.7 102.7		x	0	99.1	99.9	Clst.	Brownish Grey when Wet	2, S2 When wet	Massive										Rubbly				
102.7 105.8		x	0	99.9	104.4	Coal	Blk.	4, R2	Massive Bedded										Intact				
105.8 108.8		x	0	104.4	104.7	Clst.	Brownish Grey When Wet	2, S2	Massive							70°	102.5	Distinct	Blocky				
108.8 111.9		x	0.4	104.7	109.4	Coal	Blk.	4, R2	Bedded										Intact				
111.9 114.6		x	0.2	109.4	109.8	Clst.	Brownish Grey When Wet	2, S2								65°	108.8	Distinct	Rubbly				
114.6 117.8		x	0.2	109.8	112.9	Carb.Sh.	Blk.	1, S1					Clst.	0.15	110.1				Rubbly				
117.8 120.8		x	0										Clst.	0.1	110.8				to Disced				
120.8 124.1		x	1.2										Clst.	0.1	112.6								
124.1 127.1		x	0										Coal	0.3	112.3								
127.1 130.1		x	0	112.9	142.6	Coal	Blk.	4, R2					Carb. Sh.	0.2	113.4				Intact to				*Sound cores throughout
130.1 133.2		x	0									weakly	Clst. carb	0.25	115.3	70°	115.4	Distinct	Blocky				
133.2 136.2		x	0										Carb. Clst	0.25	115.9								
136.2 139.3		x	0										Carb. Clst.	0.1	118.3								
139.3			0										Carb. Sh.	0.1	119.8	75°	121.0	Indistinct					

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE NO 78-292
DATE 19 Sept. 1978
LOGGED BY H.Kim

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∠ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO	
142.3																							
145.4		x	0										Carb. Sh.	0.1	124.4								
145.4																							
148.4		x	0										Carb. Sh.	0.2	125.4								
148.4																							
149.5		x	0.3										Ash	0.05	125.7	75°	126.8	Distinct					
149.5													Mixed Carb.										
151.5		x	0.5									Sh.&	Clst.	0.2	129.4	65°	129.8	Distinct					
151.5													Carb.										
154.5		x	0										Clst.	0.07	135.3	70°	133.5	Distinct					
154.5																							
157.6		x	2.0										Ash	0.05	136.7								
157.6																							
160.3		x	0	142.6	142.85	Ash	White	4, R2								80°	139.3	Distinct	Intact				Contains coaly materials
160.3							Brown						Carb.						Intact to				
163.5		x	0	142.85	184.9	Coal	Black	4, R2					Sh.	0.1	150.2	65°	145.3	Contorted	Blocky	90°	142.9	154.4	
163.5																			Rubbly				
166.6		x	0										Ash	0.05	150.3	80°	148.0	Distinct	sheared		154.4	158.0	
166.6																		Distinct					
169.8		x	0										Ash	0.03	184.4	65°	150.2	Ash Cont.	Intact		158.0	159.5	
169.8																							
172.8		x	0													85°	163.6	Distinct	Sheared		159.5	160.3	
172.8																							
175.9		x	0.1													65°	170.1	Distinct	Intact		160.3	161.5	
175.9																							
178.9		x	0													65°	173.0	Distinct	Sheared		161.5	161.8	
178.9																							
182.0		x	0													65°	176.9	Distinct	Intact		161.8	162.0	
182.0																		Very	Sheared				
185.0		x	0													70°	180.9	Distinct	Rubbly		162.0	163.5	
185.0																			Blocky to				
188.0		x	0													80°	182.5	Distinct	Intact		163.5	181.7	
188.0																							
191.1			0.05													80°	183.5	Distinct	Rubbly		181.7	182.0	Broken cores may be due to high speed drilling

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE No 78-252
DATE 19 Sept. 1978
LOGGED BY H. Kim

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS: TYPE	Thickness	AT	BEDDING: ∠ to C.A.	AT	COMMENT	TECTONIC FEATURES: DESCRIPTION	∠ TO C.A.	INTERVAL FROM	INTERVAL TO
				212.0	213.0	Coal	Blk.	3, R1	Massive													
				213.0	213.4	Carb. Clst.	Brown Blk.	2, S2	Massive													
				213.4	215.0	Clst.	Greenish Grey	2, S2	Massive				Carb. Clst.	0.2	212.3							
				215.0	218.5	ss	Greenish Grey	31/2 S3 when wet	Thickly Bedded													
						END OF HOLE																

DRILLING DATA | GEOLOGICAL DESCRIPTION

HOLE NO 78-292

DATE 19 Sept. 1978

LOGGED BY H. Kim

RUN FROM	TRICONED	CORED	CORE LOSS	LITHOLOGIC FEATURES: GEOLOGICAL INTERVAL FROM	GEOLOGICAL INTERVAL TO	ROCK TYPE	COLOR	COMPACTION STRENGTH or HARDNESS	PHYSICAL CHARACTERISTICS	GRAIN SIZE	MINERALIZATION	% VITRAIN	MINOR INTERBEDS TYPE	MINOR INTERBEDS Thickness	MINOR INTERBEDS AT	BEDDING X to C.A.	BEDDING AT	BEDDING COMMENT	TECTONIC FEATURES: DESCRIPTION	X TO C.A.	INTERVAL FROM	INTERVAL TO	
191.1 194.2		x	0																	Intact		182.0	184.0	
194.2 197.2		x	0.05																	Rubbly Sheared		184.0	184.9	
197.2 200.3		x	0	184.9	185.3	Ironstone	Grey	5, R3	Massive											Rubbly to Blocky	90°	184.9	186.8	
200.3 203.3		x	2.0	185.3	204.4	Coal	Brown Black		Bedded				Carb. Clst.	0.07	185.8					Joint.	90° 0°	184.9	187.6	
203.3 206.4		x	0.2	204.4	206.1								Carb. Clst.	0.04	186.0	85°	186.5	Distinct		Intact Blocky	80°	187.6	189.6	
206.4 209.4		x	0										Carb. Clst.	0.05	192.8	88°	191.1	Distinct		Pulverized		189.6	189.9	
209.4 212.4		x	0													70°	200.0	Distinct		Jointed also Rubbly	20°	189.9	191.1	
212.4 215.5		x	0													70°	201.0	Distinct		Intact		191.1	192.2	
215.5 218.5		x	0													70°	202.0	Distinct		Rubbly	70°	192.2	195.6	
																70°	203.4	Distinct		Highly Jointed	30° 80°	195.6	197.2	
																60°	204.4	Distinct		Blocky Intact		197.2	200.3	
																				Rubbly	70°	200.3	203.3	
																				Intact, rare Blocky		203.3	212.7	
																				Rubbly		212.7	213.2	
																				Intact		213.2	218.5	
				204.4	206.1	Slst. Weakly carb.		5, R2	Massive															
				206.1	212.0	Slst., ss			Thickly Bedded	f to m														Indistinct bedding